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LIVERPOOL RANGE WIND FARM

Amendment Report

FINAL

August 2023

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Amendment Report

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Tilt Renewables Australia Pty Ltd as trustee for Liverpool Range Wind Farm Project

Project Director: Paul Douglas
Project Manager: Lachlan Sweeney
Report No. 23141/R02
Date: August 2023

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
Final	P. Douglass	14 August 2023	P. Douglass	14 August 2023

Executive Summary

Liverpool Range Wind Farm (the Project) is an approved large scale renewable energy project which is being developed by Tilt Renewables Australia Pty Ltd as trustee for Liverpool Range Wind Farm Project (Tilt Renewables). The Project is located approximately 6 km east of the township of Coolah, New South Wales (NSW) and extends across the Warrumbungle, Upper Hunter and Mid-Western Local Government Areas (LGAs). The Project is located within, and forms a key component of, the Central-West Orana (CWO) Renewable Energy Zone (REZ).

The Project is authorised by State Significant Development Consent SSD-6696 which was granted by a delegate of the Minister for Planning on 27 March 2018 (Development Consent). The Project as authorised by Development Consent is referred to as the Approved Project.

Tilt Renewables has carried out a detailed layout review and design optimisation process to progress the Project towards construction. An application to modify the Development Consent (Mod-1 Project) has been made to incorporate significant advances in wind turbine technology which have occurred since the Development Consent was granted and to reflect the findings of the layout review and design optimisation process. The Mod-1 Project modifies the Approved Project to reduce the total number of approved turbines and increase the size and efficiency of the remaining turbines.

The Mod-1 Project Modification Assessment Report was placed on public exhibition by the Department of Planning and Environment (DPE) from 20 September to 17 October 2022. During the public exhibition period 195 submissions were received, comprising 16 from government agencies, four from local Councils, seven from community stakeholder groups and 168 from individual community members. The most frequently raised issues in community submissions related to potential visual and biodiversity impacts of the Mod-1 Project. A detailed response to the issues raised during the public exhibition period is provided in the separate Submissions Report that has been prepared by Umwelt.

In response to submissions on the Mod-1 Project and ongoing project design, further amendments have been made to reduce the environmental and social impacts of the Project, resulting in a refined project design referred to as the Response to Submissions (RTS) Project. The RTS Project includes a further reduction to the number and size of turbines, changes to access tracks and a realignment of both internal and external transmission lines resulting in a 31% reduction in the total combined area of the wind farm and external transmission line Development Corridor (compared to the Mod-1 Project). The focus of the amendments for the RTS Project has been on developing a design that is constructable and allows for reduction in environmental and social impacts where possible. The RTS Project has considered these aspects through consultation with landowners to determine how the Project could best be accommodated within their individual landholdings.

Additional assessments have been undertaken to assess the potential construction and operational impacts associated with the RTS Project and how/if these differ from the Approved Project and Mod-1 Project. Assessments have been undertaken for visual impact, shadow flicker, noise, biodiversity, Aboriginal heritage, traffic, electromagnetic interference, aviation and social impacts.

The National Electricity Market (NEM) needs to rapidly transition to renewable energy to deliver the support the NSW Climate Change Policy Framework, as well as the Commonwealth Government's commitments under the Paris Agreement. At present, additional renewable energy capacity is being added to the NEM at a lower rate than what the Australian Energy Market Operator has identified as required to achieve the transition to renewable energy (Parkinson, 2023). The RTS Project will materially assist in addressing this shortfall by delivering approximately 1332 megawatts (MW) of renewable energy capacity to the NEM to help replace the generation capacity which will be lost when NSW's largest power station, Eraring, closes in 2025.

The RTS Project represents an essential part of the energy transition with a fully optimised constructible design. This Amendment Report confirms that, while there will be some unavoidable impacts from the RTS Project when compared to the Approved Project, the extent of these impacts have been minimised through the design process to the extent practicable and appropriate management, mitigation and offset measures have been committed to address residual impacts.

Glossary

Term	Definition
Applicant	Tilt Renewables Australia Pty Ltd as trustee for Liverpool Range Wind Farm Project (Tilt Renewables)
Approved Project	The Project as approved under Development Consent SSD 6696 on 27 March 2018
Conditions of consent	Conditions of the Development Consent SSD 6696 which authorise and regulate the Project
Development consent	Development Consent SSD 6696 granted under Section 4.38 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) on 27 March 2018
External transmission line	The portion of the transmission line extending from the southern-most collector substation near Rotherwood Road, Cassilis, south to the connection substation at Ulan, consisting of overhead powerline of up to 330 kV, supported by poles or towers and located within a 60 m wide easement.
Internal transmission line	The portion of the transmission line extending from the northwest of the Project site to the southernmost collector substation near Rotherwood Road, Cassilis, consisting of overhead powerline of up to 330 kV, supported by poles or towers and located within a 60 m wide easement.
Mod-1 Assessment Report	The report titled *Liverpool Range Wind Farm Modification Assessment Report (Mod-1)* and dated September 2022
Mod-1 Project	The project as described in the application to modify Development Consent SSD 6696 and Mod-1 Assessment Report
Original EIS	As defined in Development Consent SSD 6696, this includes the Environmental Impact Statement titled *Liverpool Range Wind Farm Environmental Assessment*, prepared by Epuron Pty Ltd and dated July 2014, as modified by the *Liverpool Range Wind Farm Response to Submissions*
Project Amendments	The proposed amendments to the Mod-1 Project
RTS development corridor	A buffer area around the RTS indicative development footprint incorporating areas of adjoining land to allow for micro-siting of infrastructure
RTS indicative development footprint	The estimated ground disturbance and vegetation removal required for construction of the RTS Project, including turbine hardstands, internal access tracks and other temporary and permanent ancillary infrastructure, collector substations and ancillary equipment, and internal and external transmission lines
RTS Project	The Project as described in this report (incorporating the Project Amendments to the Mod-1 Project)
The Project	Liverpool Range Wind Farm Project

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1.0 Introduction

1.1 Background

Liverpool Range Wind Farm (the Project) is an approved large scale renewable energy project that is owned by Tilt Renewables Australia Pty Ltd as trustee for Liverpool Range Wind Farm Project (Tilt Renewables). The Project is authorised under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) by State Significant Development Consent SSD-6696, which was granted on 27 March 2018 by a delegate of the Minister for Planning (Development Consent). The Project was originally developed by Epuron Pty Ltd and was acquired by Tilt Renewables in March 2019.

The Approved Project site spans approximately 51,337 hectares (ha) and 67.5 kilometres (km) in length from north to south. The site is located approximately 6 km east of the township of Coolah, NSW and extends across the Warrumbungle, Upper Hunter and Mid-Western Local Government Areas (LGAs). The Project is located within, and forms a key component of, the Central-West Orana (CWO) Renewable Energy Zone (REZ) declared under the *Electricity Infrastructure Investment Act 2020* (NSW) (refer to **Figure 1.1**).

The Development Consent authorises the construction, operation and decommissioning of up to 267 wind turbines with a maximum tip height of 165 m and associated infrastructure including a transmission line with an indicative capacity of 330 kV from within the wind farm to the proposed connection point at Ulan.

Since the Development Consent was granted, there have been significant advances in wind turbine technology. Since acquiring the Approved Project in 2019, Tilt Renewables has undertaken a detailed layout review and design optimisation process to progress the Project towards construction. The application to modify the Development Consent (Mod-1 Project) was pursued in order to take advantage of these technology changes and to reflect the findings of the layout review and design optimisation process, and in doing so provide greater certainty with regards to the constructability of the Project and associated potential environmental impacts.

The Mod-1 Project sought to modify the Approved Project layout to reduce the number of turbines and increase the size and efficiency of each turbine. A detailed description of the Mod-1 Project is provided in **Section 1.2**. In particular, the Mod-1 Project sought to:

- increase the indicative renewable energy generation capacity from approximately 962 MW to approximately 1,320 MW while reducing the total number of turbines
- increase the estimated greenhouse gas benefits from approximately 2.1 million tonnes of CO_2 savings per year to approximately 2.9 million tonnes CO_2 savings per year.

In response to government agency and community submissions on the Mod-1 Project, further amendments have been made to the Project to reduce the environmental and social impacts, resulting in an amended project design referred to as the Response to Submissions (RTS) Project. A detailed description of the amendments to the Mod-1 Project that have resulted in the RTS Project is presented in **Section 3.0**. The issues raised in the government agency and community submissions on the Mod-1 Project and the response to these is provided in the Submissions Report which will be submitted concurrently to the NSW Department of Planning and Environment (DPE) with this Amendment Report.

The National Electricity Market (NEM) needs to rapidly transition to renewable energy to support the NSW Climate Change Policy Framework, as well as the Commonwealth Government's commitments under the Paris Agreement. At present, additional renewable energy capacity is being added to the NEM at a lower rate than what the Australian Energy Market Operator has identified as required to achieve the transition to renewable energy (Parkinson, 2023). The RTS Project will materially assist in addressing this shortfall by delivering approximately 1,332 megawatts (MW) of renewable energy capacity to the NEM to help replace the generation capacity which will be lost when NSW's largest power station, Eraring, closes in 2025.

1.2 The Mod-1 Project

The Mod-1 Project included a number of changes to the Approved Project which will involve the construction, operation, replacement or upgrade, and decommissioning of the Liverpool Range Wind Farm, including transmission line and ancillary infrastructure.

The Mod-1 Project updated the Approved Project, so that it was made up of the following key components (refer to **Figure 1.2** and **Figure 1.3**):

- **Wind Turbines**: up to 220 wind turbines with a maximum blade tip height of 250 metres, including an adjacent hardstand area for lift cranes and a material laydown.
- **Collector Substations**: up to seven collection substations that step-up the voltage of the reticulation cabling (typically 22 kV or 33 kV) to the transmission line voltage (anticipated to be 330 kV). The collector substations are comprised of multiple components including transformers, circuit breakers, bus bars, and gantries, and are anticipated to occupy a 3D envelope approximately 70 m long x 60 m wide x 9 m high. The steel gantries that support the incoming/outgoing power lines are anticipated to be approximately 25 m high.
- **Connection Substation (also referred to as Switchyard):** a single 330 kV connection substation located at the southern end of the Modified Site Boundary at Ulan, to facilitate connection into the existing Transgrid 330 kV Wellington - Wollar transmission line. Similar to substations, switching stations typically contain bus bars, circuit breakers and steel gantries. The switching station is anticipated to occupy a 3D envelope approximately 150 m long x 100 m wide x 9 m high. Steel gantries that support the power lines are anticipated to be approximately 25 m high.
- **Internal Transmission Line:** overhead powerline of up to 330 kV, supported by poles or towers and located within a 60 m wide easement, that extends from the northwest of the Project site to the southernmost collector substation proposed near Rotherwood Road, Cassilis. The supporting poles are anticipated to be of a steel construction with an indicative height of approximately 30–50 m, generally located at intervals of approximately 300 m wherever practicable. Steel towers may need to be used, particularly in complex terrain, as they allow for longer spans and less tower structures. Steel towers are anticipated to have an indicative height of approximately 40–50 m.
- **External Transmission Line:** overhead powerline of up to 330 kV, supported by poles or towers and located within a 60 m wide easement, that extends from the southern-most collector substation proposed near Rotherwood Road, Cassilis south to the connection substation proposed at Ulan. The anticipated design is as described above for the Internal Transmission Line.

- **Reticulation cabling:** underground electrical reticulation cabling, and potentially some overhead powerlines, that provide an electrical connection between the wind turbines and the collector substations. Reticulation cabling is typically rated at 22 kV or 33 kV.
- **Access Tracks:** access tracks, typically with a trafficable width of 5.5–6 m, to provide access from the public road network to wind farm and transmission line infrastructure and meteorological masts.
- **Site Access Points:** provision of the following site access points off public roads:
    - up to 47 site access points from nearby public roads to facilitate construction and ongoing maintenance of the wind farm components located north of the Golden Highway
    - up to 43 site access points from nearby public roads to facilitate construction and ongoing maintenance of the proposed External Transmission Line located south of the Golden Highway.
- **Operation and Maintenance (O&M) Facilities:** up to three O&M facilities incorporating a control room, maintenance and equipment storage facilities. The O&M facility is used to store spare parts and other equipment used for ongoing maintenance of the wind farm. The O&M facility is anticipated to occupy a 3D envelope approximately 45 m long x 30 m wide x 15 m high.
- **Temporary Construction Compound/Laydown Area/Concrete Batch Plants:** Up to 10 temporary construction facilities, including temporary concrete batching plants, rock crushing equipment, temporary laydown facilities, and construction compounds, of which nine are located within the Wind Farm Site and one located off Cliffdale Road, Turill within the External Transmission Line Site.
- **Public Road Upgrades:** upgrades to Local and Regional public roads in proximity to the Project site required for the delivery, installation and maintenance of wind turbines, transmission lines, and related infrastructure, in accordance with road upgrade standards as agreed with the relevant Roads Authorities.
- **Permanent Wind Monitoring Masts (Met Masts):** up to 14 permanent Power Curve Validation (PCV) met masts to the final hub height, and associated access tracks.
- **Temporary Site Calibration Met Masts:** up to 28 temporary site calibration met masts to the final hub height, to be located at a subset of the turbine locations and removed prior to erection of each relevant turbine.
- **Subdivision of Land:** subdivision of land within the Modified Site Boundary to create new separate lots for the connection and collector substations, and associated ancillary facilities.

1.3 Approval Pathway

On 2 February 2021 DPE provided the following response to Tilt Renewables' Letter of Intent regarding the Mod-1 Project, which confirms the appropriate planning approval pathway is a modification to the Development Consent under section 4.55(2) of the EP&A Act:

> *"I refer to your letter indicating the intention to modify the Liverpool Range Wind Farm development consent (SSD 6696) to increase the maximum wind turbine tip height, decrease the number of wind turbines, amend the construction traffic route and increase disturbance areas across site.*

…Based on the information provided, the Department considers that the appropriate approval pathway for the modification application would be section 4.55(2) of the Environment Planning and Assessment Act 1979 (The Act) and the Department would place the modification application on public exhibition for a minimum of 14 days."

The application of Section 4.55(2) of the EP&A Act was addressed in detail in the Mod-1 Project Modification Assessment Report. This included consideration of the application of the 'Substantially the Same Development' Test to the Mod-1 Project in light of the key principles from relevant case law and confirmed that the Mod-1 Project remains 'substantially the same development' as that originally authorised by the Development Consent.

The further changes proposed to the Project as part of the RTS Project further reduce the impacts of the modifications and do not change the conclusion that the modified Project remains 'substantially the same development' as that originally authorised by the Development Consent.

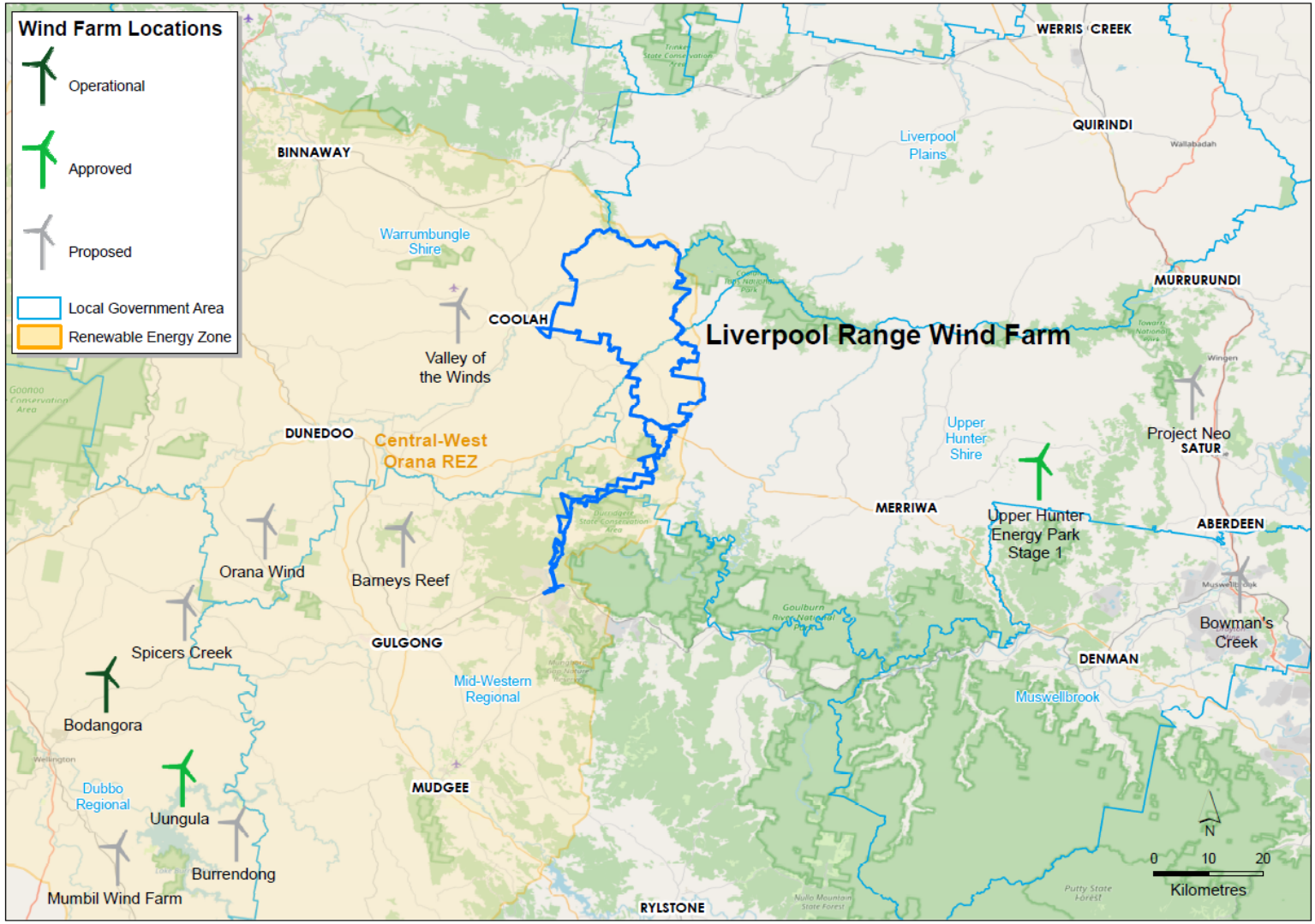


Figure 1.1 Locality Map

Source: Tilt Renewables, 2023.

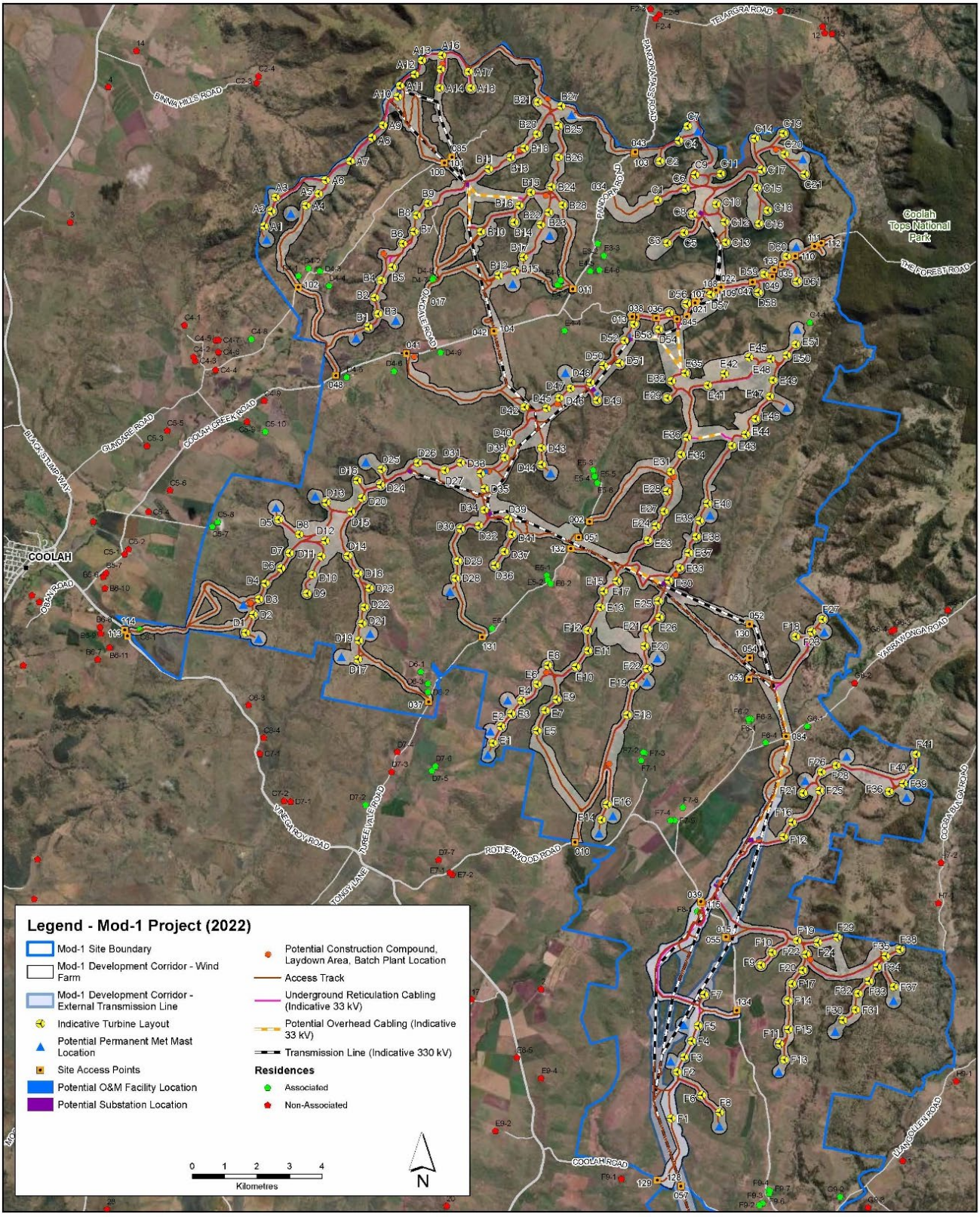


Figure 1.2 Mod-1 Project (2022) Layout (northern section)

Source: Tilt Renewables, 2023.

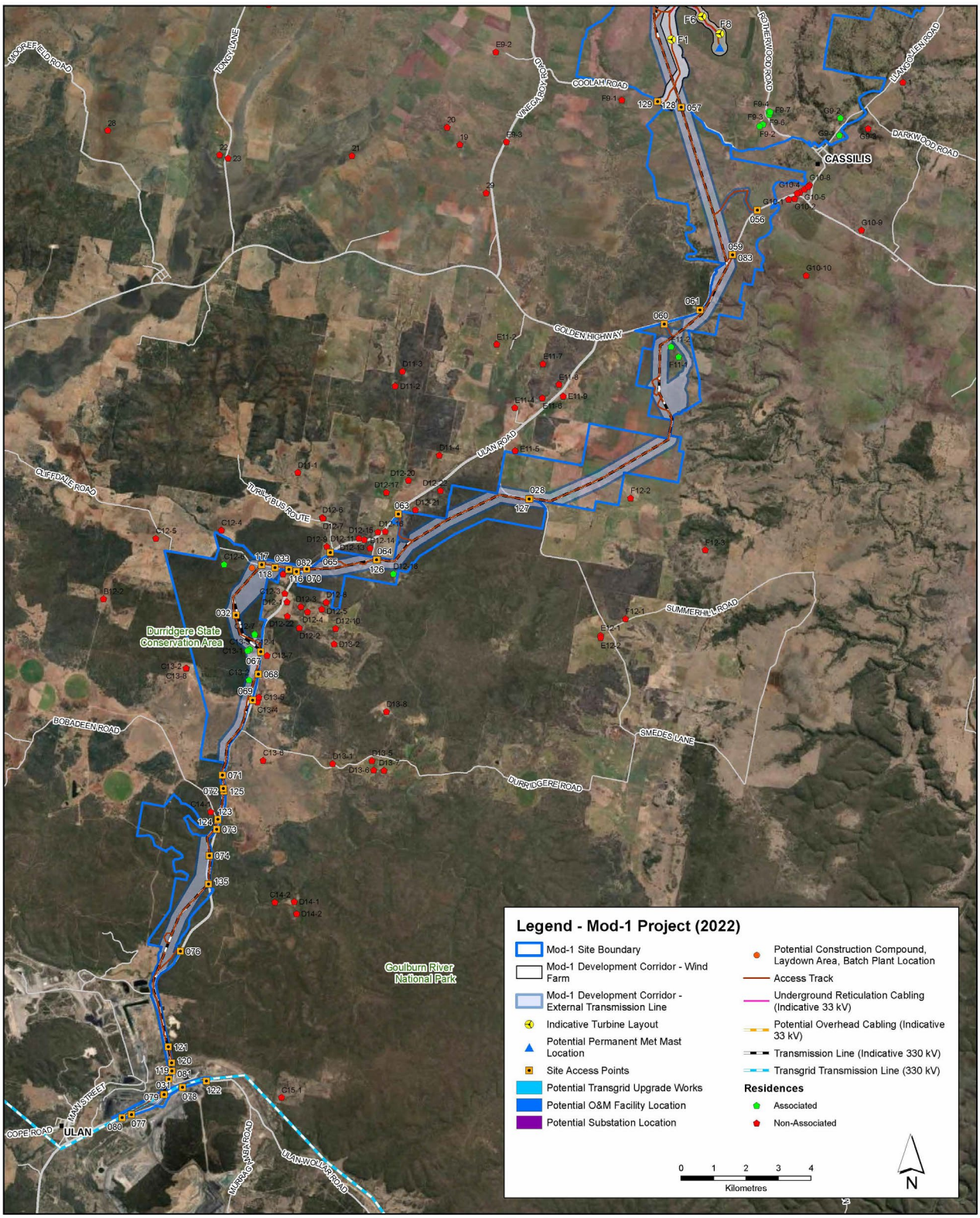


Figure 1.3 Mod-1 Project (2022) Layout (southern section)

Source: Tilt Renewables.

1.4 Proposed Amendments

Several design amendments have been made to the Mod-1 Project in response to ongoing consultation with agencies, progression of detailed design and submissions received during the exhibition period. The further refinements to the Approved Project which are now proposed as part of the modification are referred to as the RTS Project.

The RTS Project includes the following key amendments when compared to the Mod 1 Project:

- Reduced number of turbines from 220 turbines down to 185 turbines (reduction of 35 turbines).
- Reduced maximum blade tip height from 250 m above ground level (AGL) to 215 m AGL (reduction of 35 m).
- Indicative rotor diameter reduced from 210 m to 172 m (reduction of 38 m).
- Removal or relocation of multiple turbines to avoid/minimise potential environmental impacts.
- Reduced number of permanent meteorological (met) masts from 14 down to 10 (reduction of 4 met masts).
- Reduced area of Development Corridor from 12,601.6 ha to 8,718.2 ha due to design changes, including removal of turbines and associated access tracks, and implementing steeper cut and fill batters where feasible.
- Realignment of the internal 330 kV transmission line in an east-west direction between the C Cluster and B Cluster and relocation of the C Cluster substation, reducing the length of transmission line by approximately 2 km.
- Realignment of the external 330 kV transmission line by shifting slightly to the east onto freehold land (via a landholder agreement) to avoid a section of the Durridgere State Conservation Area.
- Redesign of the internal transmission line and wind farm connector substation in the F Cluster to enable connection into the Central-West Orana Renewable Energy Zone (CWO REZ) transmission line and Merotherie Energy Hub proposed by EnergyCo. Approval is being sought to connect the Project into the CWO transmission line (and remove the external transmission line connection to Ulan) in the event the delivery timeframes for the CWO REZ transmission line align with the Liverpool Range Wind Farm project (for further information see **Section 2.2**).
- Additional restrictions to over size/over mass (OSOM) vehicle movements on some roads and changes to site access points to reduce traffic impacts.
- Removal of Coolah Road from the Project, such that no light, heavy or OSOM vehicles are proposed to use Coolah Road during construction.
- Amendments to O&M facility locations.

A summary of the key proposed amendments to the Mod-1 Project are provided in **Table 1.1**, with an overview map provided in **Figure 1.4** below. The proposed amendments are described in detail in **Section 3.0.**

Table 1.1 Summary of Key Proposed Amendments to the Mod-1 Project

No.	Description
1	Restriction of use of the access track between turbines A6 and A10 to light and heavy vehicles only to minimise ground disturbance area. OSOM vehicles will not be permitted to use this access track.
2	Removal of three turbines (A7, A8 and A9) to minimise ground disturbance and impacts to native vegetation.
3	Minor realignment of overhead 330 kV transmission line to connect into relocated Substation A.
4	Removal of three turbines (A11, A12 and A13) to minimise ground disturbance and impacts to native vegetation.
5	Removal of optional overhead 330 kV transmission line alignment.
6	Removal of optional overhead 33 kV reticulation line.
7	Removal of three turbines (B12, B15 and B17) and associated access tracks from the public road to minimise ground disturbance and avoid impacts to Box Gum Woodland CEEC.
8	Removal of three turbines (B22, B23 and B28) to minimise ground disturbance and impacts to native vegetation.
9	Removal of duplicated site access point and access tracks.
10	Realignment of internal 330 kV overhead transmission line between C Cluster and B Cluster.
11	Restriction of use of the first 2.9 km of State Forest Road to light and heavy vehicles only. OSOM vehicles will not be permitted to use this section of State Forest Road. Instead OSOM vehicles would enter the D Cluster via Coolah Creek Road and travel northbound on internal wind farm access tracks and turn right onto State Forest Road near turbine D53 to access turbines D54, D55, D57, D58 and D59 located off the eastern portion of State Forest Road.
12	Relocation of Substation C approximately 600 m west to enable realignment of transmission line between C Cluster and B Cluster (refer to Item 10 above).
13	Removal of one turbine (D56) to minimise ground disturbance and impacts to native vegetation.
14	Removal of one turbine (C10) to minimise ground disturbance and impacts to native vegetation.
15	Removal of 330 kV overhead transmission line between C Cluster and D Cluster to reduce visibility of transmission line infrastructure along State Forest Road.
16	Removal of three turbines (C19, C20 and C21) and associated infrastructure to reduce visibility from Pinnacle Lookout, reduce potential turbine noise impacts within Coolah Tops National Park, avoid impacts to a sensitive area of cultural heritage, and avoid impacts to native vegetation.
17	Removal of two turbines (D60 and D61) to minimise visibility from Pinnacle Lookout, minimise potential turbine noise encroachment into Coolah Tops National Park, and avoid impacts to native vegetation.
18	Removal of optional overhead 33 kV reticulation line.
19	Removal of optional overhead 33 kV reticulation line.
20	a) Removal of duplicate access track off Turee Vale Road. b) Relocation of three turbines (D43, D40 and E31) to avoid impacts to NSW Telco's proposed communication link.
21	Removal of two turbines (E41 and E 42) to minimise ground disturbance and impacts to native vegetation.
22	Removal of one turbine (E49) to minimise ground disturbance and impacts to native vegetation.

No.	Description
23	Removal of one turbine (E27) to minimise ground disturbance and impacts to Box Gum Woodland CEEC.
24	Removal of one turbine (E30) to achieve minimum separation distance between turbines and substation.
25	Reduction in the maximum number of permanent met mast locations required, due to a reduction in the maximum number of turbines proposed from 220 down to 185, better understanding of power curve validation testing requirements associated with the preferred turbine (Vestas V172 7.2 MW).
26	Addition of a potential location for an O&M facility.
27	Addition of a potential location for an O&M facility.
28	Removal of two optional access track alignments.
29	Removal of optional overhead 330 kV transmission line.
30	Restriction of use of Bounty Creek Road and Warung Road to light and heavy vehicles only as a result of the removal of turbines F18, F23, and F27. OSOM vehicles will not be permitted to use these roads.
31	Removal of three turbines (F18, F23 and F27) and associated infrastructure to avoid impacts to higher quality Box Gum Woodland CEEC.
32	Removal of four turbines (F36, F39, F40 and F41) and associated infrastructure to avoid impacts to higher quality Box Gum Woodland CEEC.
33	Realignment of overhead 330 kV transmission line to avoid intact patch of treed vegetation and increase separation distance from nearby residence (F8-1).
34	Realignment of optional overhead 330 kV transmission line to minimise impact to intact treed vegetation and increase separation distance from nearby residence (F8-1).
35	Realignment of underground 33 kV reticulation cabling from turbine F07 in a more direct route towards Substation F.
36	Removal of underground 33 kV reticulation cabling as alignment now follows a more direct route between turbine F07 and Substation F.
37	Realignment of access track from Rotherwood Road to utilise existing access track and minimise ground disturbance.
38	Removal of two turbines (E19 and F29) to minimise impacts to Box Gum Woodland CEEC.
39	Removal of two turbines (F37 and F38) and associated infrastructure to avoid impacts to higher quality Box Gum Woodland CEEC.
40	Removal of use of Coolah Road by all vehicles (light, heavy and OSOM) as a result of removal of duplicate site access points. Access will instead be provided from Rotherwood Road.
41	Removal of duplicate site access point and access track from Coolah Road.
42	Removal of larger areas of mapped Box Gum Woodland CEEC from the Modified Development Corridor (both within the wind farm and along external transmission line) wherever practicable to avoid potential impacts.
43	Removal of optional external 330 kV transmission line alignment to avoid impacts to Durridgere State Conservation Area in this location.

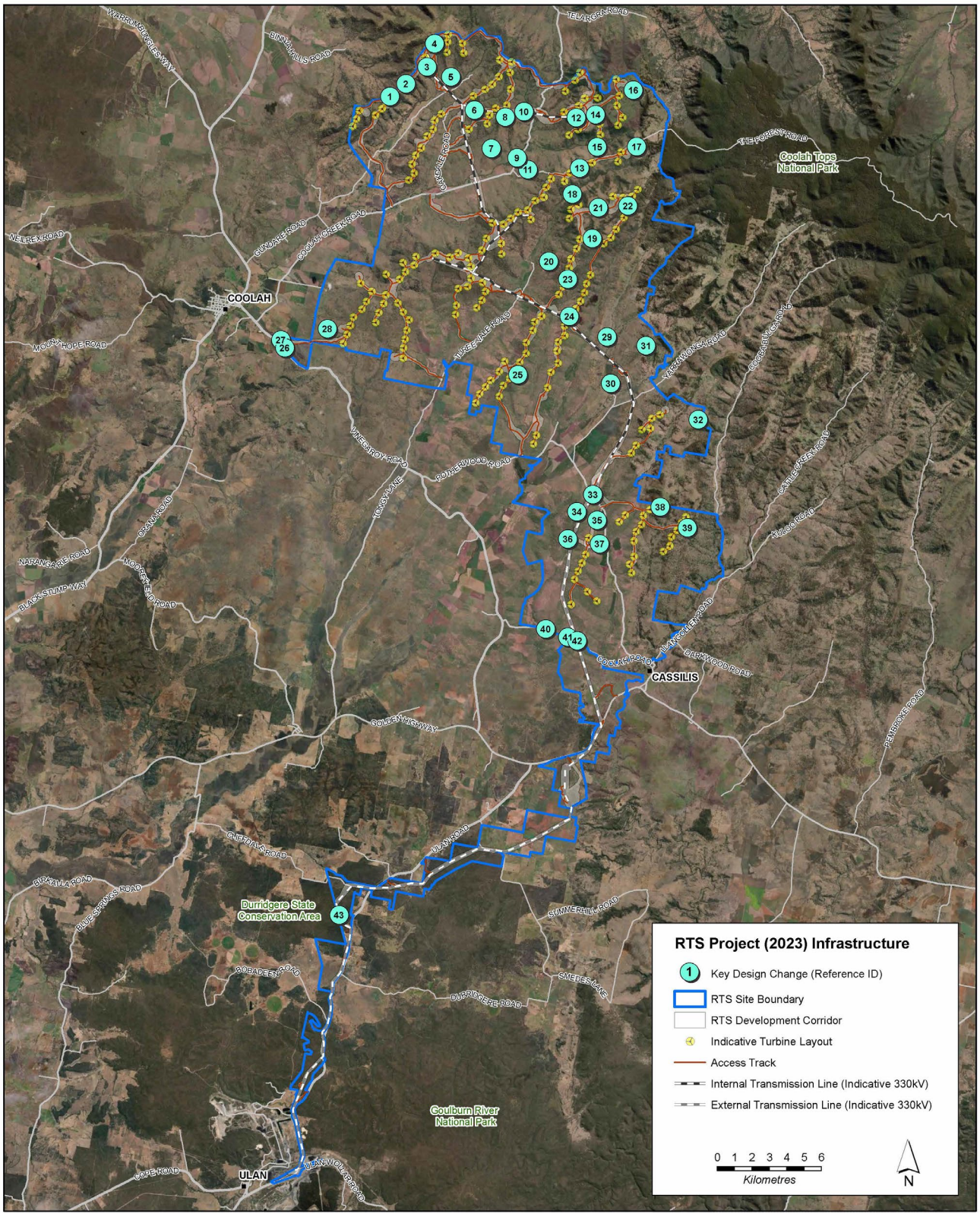


Figure 1.4 Proposed Amendments to the Mod-1 Project Infrastructure Layout

Source: Tilt Renewables, 2023.

In addition to the physical project parameters there is also a change to the estimated peak construction workforce, revised from 800 to approximately 550 workers. This estimated peak workforce will be firmed up once the Balance of Plant (BOP) Contractor has been selected and detailed design and construction scheduling progresses, which is anticipated to be in late 2023.

The amendments to the Mod-1 Project have been proposed for the following reasons:

- Ongoing landholder consultation
    - Removal of turbines to reduce visual impacts from specific viewpoints.
    - Relocation of turbines to reduce visual impacts from specific viewpoints.
    - Change to internal transmission line alignment to reduce visual impacts within specific landscapes.
- Ongoing agency consultation
    - Removal of turbines within the F Cluster group of turbines to reduce the disturbance area within the Box Gum Woodland critically endangered ecological community (CEEC) listed under the Biodiversity Conservation Act 2016 (BC Act). The F Cluster contains the largest concentration of moderate and good quality Box Gum Woodland CEEC within the Project site.
    - The civil design was progressed within the F-cluster group of turbines to reduce the disturbance area within the Box Gum Woodland CEEC to the extent practicable.
    - Removal of five turbines and associated infrastructure to reduce visibility from Pinnacle Lookout, reduce potential turbine noise impacts within Coolah Tops National Park, and avoid impacts to a sensitive area of cultural heritage.
    - Relocation of three turbines to avoid impacts to NSW Telecommunications Authority's (NSW Telco) proposed communications link.
    - Agreement on extent of local public road upgrades through discussion with Warrumbungle Shire Council and Upper Hunter Shire Council.
- Further minimisation of environmental impacts
    - Removal and relocation of turbines to minimise ground disturbance and/or disturbance footprint.
    - Wind farm development corridor reduced by approximately 29% when compared to the Mod-1 Project.
    - External transmission line development corridor reduced by approximately 47% (compared to the Mod-1 Project).
    - Removal of an optional section of the external 330 kV transmission line alignment to avoid impacts to a portion of the Durridgere State Conservation Area.
    - Reduction in the area of impact adjacent to wind farm access tracks with the inclusion of Static Synchronous Compensators (STATCOMs) which minimise the number of adjacent underground 33 kV reticulation cables required and substantially reduces the extent of associated ground disturbance.
    - Reduction in internal access track length by approximately 5% (compared to the Mod-1 Project) resulting in reduced disturbance footprint.

- Refinements to engineering design and construction planning
    - Relocation of turbines to achieve the minimum separation requirements between turbines, substations and overhead transmission line.
    - Relocation or removal of several turbines to avoid encroachment within 100 m of the Project site boundary.

1.5 Structure of This Report

This Amendment Report is structured in accordance with the DPIE Guideline (2022) as presented in **Table 1.2**.

Table 1.2 Report structure

Section	Description
Section 1.0	Provides a brief summary of the Mod-1 Project to provide context for the amendments.
Section 2.0	Identifies any changes to the strategic context relevant to the RTS Project.
Section 3.0	Describes the proposed amendments to the Mod-1 Project.
Section 4.0	Identifies any changes to the statutory requirements as a result of the proposed amendments to the Mod-1 Project.
Section 5.0	Summarises the stakeholder engagement that has been undertaken during the development of the RTS Project.
Section 6.0	Provides a detailed summary of any changes in impacts resulting from the proposed amendments to the Mod-1 Project.
Section 7.0	Provides an updated justification of the amended Mod-1 Project.
Section 8.0	Provides a list of references used during the preparation of this report.
Appendices	Information and technical reports supporting the main document.

2.0 Strategic Context

The strategic context and need for the proposed modification to the Approved Project are described in Section 4 of the Original Environmental Impact Statement (EIS) and Section 5 of the Mod-1 Assessment Report. In summary, the Project is aligned with the NSW and Commonwealth governments' energy and climate policies and will make a meaningful contribution to achieving the goal of net zero emissions by 2050. The modifications proposed to the Approved Project will increase the overall generation capacity of the Project while reducing the maximum number of turbines and ensure that the Project is fully constructible.

2.1 Strategic Context for the RTS Project

The RTS Project, described in **Section 3.0**, generally consists of refinements to the various component elements of the wind farm and does not change the overall strategic context of the Project. The reasons for the further proposed Project amendments are provided in **Section 1.4** and generally consist of changes as a result of the ongoing design and construction planning process and consultation with landowners and stakeholders to reduce potential impacts. An overview of the strategic context for the Project, incorporating the Project amendments, is provided below.

2.1.1 Renewable Energy Market

The development of a renewable energy project aligns with global, Commonwealth and NSW commitments to increase renewable energy generation and reduce carbon emissions across the NSW and Australian economies.

NSW is currently in a transition to build a reliable, affordable and sustainable electricity future to support a growing economy (NSW Government, 2023a). The State's five existing coal fired power stations will progressively close starting from 2022-23. These power stations currently provide around three quarters of NSW's electricity supply and two thirds of the firm capacity required during peak demand periods. In NSW, all five of the coal-fired power stations are scheduled to retire before 2043 (AEMO, 2019) beginning with Liddell Power Station which was closed in in April 2023. Next, Eraring Power Station is currently scheduled to retire in 2025. The NSW Government is taking action to deliver cheap, reliable, and clean electricity for homes and businesses in NSW (EnergyCo, 2023a).

The NSW Government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades.

Various government strategies, plans and policies such as the Australian Energy Market Operator's (AEMOs) Integrated Systems Plan (ISP) (AEMO, 2022), the NSW Transmission Infrastructure Strategy (NSW Government, 2023c) and NSW Electricity Infrastructure Roadmap (NSW Government, 2023b), identify the important role for REZs to provide an effective and economical way to integrate new generation, storage and transmission development (EnergyCo, 2023a).

The CWO REZ was formally declared on 5 November 2021 under the *Electricity Infrastructure Investment Act 2020*, with NSW EnergyCo appointed the Infrastructure Planner responsible for the coordination of the development of generation and network infrastructure (refer to **Section 2.2**). In Australia in 2020–2021, fossil fuels contributed 71% of the total electricity generation, including coal (51%), gas (18%) and oil (2%). The share of coal in the electricity sector has continued to decline in contrast to the beginning of the century when coal's share of electricity generation exceeded 80%. The contribution of renewable energy to the total national electricity generation increased from 21% in 2019 to 29% in 2020-2021 (DCCEEW, 2022a). That said, additional renewable energy capacity is being added to the National Electricity Market (NEM) at a lower rate than what AEMO has identified as has identified as required to achieve the transition to renewable energy (Parkinson, 2023). The RTS Project will materially assist in addressing this shortfall by delivering approximately 1,332 megawatts (MW) of renewable energy capacity to the NEM to help replace the generation capacity which will be lost when NSW's largest power station, Eraring, closes in 2025.

The Project aligns with the current strategic direction of the NSW and Australian energy generation market and assists in achieving the planned transition to an increased contribution of renewable energy to Australia's energy needs. As an approved renewable energy project located within the CWO REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. As an existing renewable energy operator in Australia, Tilt Renewables has a track record of delivering large-scale renewable energy projects.

2.1.2 Commonwealth Renewable Energy Commitments

Australia is one of the 193 Parties (192 countries plus the European Union) from around the world participating in the international climate change agreement (the Paris Agreement) (United Nations, n.d.). The Paris Agreement aims to:

- hold the increase in the global average temperature to below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels
- increase the ability (of nations) to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production
- make finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development.

Australia signed the Paris Agreement on 22 April 2016. The obligations under the Paris Agreement will drive national greenhouse gas policy up to 2030. Australia's commitment to the Paris Agreement includes reducing greenhouse gas emissions to 43% below 2005 levels by 2030 (DCCEEW, 2022b).

In 2022, the Commonwealth Government stated its ambition to put the country on track to achieve net zero emissions by 2050 (McAllister & Albanese, 2022). Australia's Nationally Determined Contribution (NDC) prescribes an unconditional economy-wide target to reduce greenhouse gas emissions, and states that future policies will target emissions generated from energy use, industrial processes, agriculture, land-use, land-use change and forestry and waste.

2.1.3 NSW Renewable Energy Commitments

The NSW Government has developed its NSW Climate Change Policy Framework, which aims to deliver net zero emissions by 2050, and a State that is more resilient and responsive to climate change (OEH, 2016).

Under the NSW Climate Change Policy Framework, NSW has committed to both follow the Paris Agreement and to work to complement national action.

The policy framework is being delivered through:

- the Climate Change Fund
- developing an economic appraisal methodology to value greenhouse gas emissions mitigation
- embedding climate change mitigation and adaptation across government operations
- building on NSW's expansion of renewable energy
- developing action plans and strategies.

In 2013, the NSW Government released the Renewable Energy Action Plan (REAP) and the NSW Energy Efficiency Action Plan (EEAP).

The EEAP aimed to increase the generation, storage and use of renewable energy in NSW, at least cost to customers and with maximum benefits to NSW. The three core goals of the EEAP were to attract renewable energy investment, build community support for renewable energy and attract and grow expertise in renewable energy. Based on the implementation of the EEAP, renewable energy is now well-placed to play a leading role in meeting NSW's energy needs into the future.

Current and future electricity development in NSW is supported though the NSW Government's Electricity Strategy (NSW Government, 2023a) and the NSW Electricity Infrastructure Roadmap which builds on the framework set out in the Electricity Strategy taking an integrated approach to all demand and supply options, including action by households and small businesses, demand management and investment in large-scale, affordable and reliable generation. The Project is consistent with the objectives of the Electricity Strategy and Infrastructure Road Map, in aiming to provide large-scale renewable electricity generation that is affordable and reliable.

In March 2020 the NSW Government released its *Net Zero Plan Stage 1: 2020-2030* which aims to reduce emissions by 35% in NSW by 2030 compared to 2005 levels, and sets out a commitment to fast-track the delivery of renewable energy zones across NSW. The Net Zero Plan identifies the Central-West Orana, New England and South-West REZs as playing a critical role in attracting investment into renewable energy projects to replace retiring power plants across NSW.

2.2 Central-West Orana Renewable Energy Zone

The Project is located within the Central-West Orana Renewable Energy Zone (CWO REZ).

NSW Energy Corporation (EnergyCo) is coordinating the delivery of the CWO REZ, and is developing the CWO REZ Transmission Line project which includes a 330 kV transmission line between Merotherie Energy Hub and the Liverpool Range Wind Farm project. At present it is intended that the RTS Project would use CWO REZ Transmission Line to connect into the national electricity grid. EnergyCo's proposed transmission line corridor can be viewed here: https://caportal.com.au/energyco/rez.

In circumstances where the Project connects into the CWO REZ Transmission Line, the external transmission line connection down to Ulan which forms part of the RTS Project would no longer be required and all impacts associated with the external transmission line would be avoided. However, given that the CWO REZ Transmission Line is yet to be approved, the External Transmission Line remains part of the RTS Project to ensure that the Project can still connect to the national electricity grid in the unlikely event that the delivery timeframes for the CWO REZ Transmission Line project do not align.

EnergyCo and its delivery partners are responsible for obtaining all required approvals for the CWO REZ Transmission Line and for the construction and operation of the CWO REZ Transmission Line. At present EnergyCo expects that the Environmental Impact Statement for the CWO REZ Transmission Line (and other transmission infrastructure) will be submitted in late 2023.

3.0 Description of the Amendments

3.1 Overview of Proposed Amendments to the Mod-1 Project

For each of the key Project elements, **Table 3.1** provides a comparison between the Mod-1 Project, as exhibited in the Mod-1 Assessment Report, and the RTS Project which incorporates the proposed amendments to the Mod-1 Project. This comparison is provided to assist in understanding the changes proposed to the Mod -1 Project. A full description of each these changes is provided in **Section 3.2.**
The turbine and infrastructure layout proposed by the RTS Project is shown in **Figure 3.1** and **Figure 3.2**.
A comparison between the RTS Project and Mod-1 Project turbine layout and ancillary infrastructure layout is shown in **Figure 3.6** and **Figure 3.7, Figure 3.6** and **Figure 3.7**.

A comparison between the Approved Project and final modification now proposed as part of the RTS Project is provided in **Table 3.3** to illustrate the difference between the approved and now proposed elements of the Project. This comparison illustrates the difference between what is currently approved and what is now proposed, and therefore represents the proposed modifications to the existing Development Consent which requires assessment under section 4.55(2) of the EP&A Act. A comparison between the RTS Project and Approved Project turbine layout and ancillary infrastructure layout is shown in **Figure 3.8**, **Figure 3.9** and **Figure 3.10**. An updated Project description for the RTS Project is provided in **Appendix 1**.

Table 3.1 Comparison of Mod-1 Project and RTS Project

Project Element	Mod-1 Project (as exhibited in Mod-1 Assessment Report) (2022)	RTS Project (incorporating proposed amendments) (2023)	Reference
Site boundary			
Site boundary area	52,122.9 ha comprised of: • 46,539 ha (wind farm) • 5,583.9 ha (external transmission line).	51,389 ha comprised of: • 46,532 ha (wind farm) • 4,857 ha (external transmission line). Total combined site boundary area reduced by 733.9 ha (-1%)	**Section 3.2.1**
Development corridor	12,601.6 ha comprised of: • 10,317.1 ha (wind farm) • 2,906.2 ha (external transmission line). *Note: the combined area exceeds 12,601.6 ha due to partial overlap of the Wind Farm and External Transmission Line portions of the Mod-1 Development Corridor.*	8,718.2 ha comprised of: • 7,322.3 ha (wind farm) • 1,540.5 ha (external transmission line). Total combined Development Corridor is reduced by 3,883.4 ha (-31%) which is comprised of following reductions: • Reduction of 2,994.8 ha (-29%) (wind farm). • Reduction of 1,365.7 ha (-47%) (external transmission line). *Note: the combined area exceeds 8,718.2 ha due to partial overlap (144.6 ha) of the Wind Farm and External Transmission Line portions of the RTS Development Corridor.*	**Section 3.2.1**

Project Element	Mod-1 Project (as exhibited in Mod-1 Assessment Report) (2022)	RTS Project (incorporating proposed amendments) (2023)	Reference
Turbine parameters and turbine layout			
Number of turbines	220	185 (reduced by 35) (-16%)	**Section 3.2.2**
Maximum blade tip height (AGL)	250 m	215 m (reduced by 35 m) (-14%)	
Hub height	160 m	129 m (reduced by 31 m) (-19%)	
Indicative rotor diameter	210 m	172 m (reduced by 38 m) (-18%)	
Indicative minimum blade ground clearance	40 m	No change	
Indicative rotor swept area (RSA) per turbines	34,636 m^2	23,235 m^2 (reduced by 11,401 m^2) (-33%)	
Indicative total RSA for wind farm	7,619,920 m^2	4,298,475 m^2 (reduced by 3,321,445 m^2) (-44%)	
Indicative generating capacity	1,320 MW	1,332 MW (increased by 12 MW) (+1%)	
Wind farm layout	As shown in Figures 3 and 4 of the Mod-1 Assessment Report.	As shown in **Figure 3.3**	
Ancillary infrastructure			
Wind farm access track length	259.9 km	246.4 km (reduced by 13.5 km) (-5%)	**Section 3.2.3**
Internal transmission line length	43.93 km	41.7 km (reduced by 2.2 km) (-5%)	
Reticulation cabling length	Underground: 196.4 km Overhead line (potential): 13.11 km	Underground: 173.5 km (reduced by 22.9 km) (-12%)	
Permanent PCV met masts	Up to 14, up to final hub height (40 indicative locations)	Up to 10, up to final hub height (11 indicative locations) (reduced by 4) (-29%)	
Collector substations	Up to 7 (10 indicative locations)	Up to 7 (7 indicative locations) (no change in maximum number)	
O&M facilities	Up to 3 (6 indicative locations)	Up to 3 (3 locations identified) (no change in maximum number)	
Temporary calibration met masts	Up to 28, up to final hub height	Up to 10, up to final hub height (reduced by 18) (-64%)	
Temporary concrete batch plants	Up to 9 (18 indicative locations)	Up to 9 (13 indicative locations) (no change in maximum number)	

Project Element	Mod-1 Project (as exhibited in Mod-1 Assessment Report) (2022)	RTS Project (incorporating proposed amendments) (2023)	Reference
Temporary construction compound/ laydown areas	Up to 9 (18 indicative locations)	Up to 9 (13 indicative locations) (no change in maximum number)	
External transmission line and connection infrastructure			
External transmission line length	56.24 km	54.6 km (reduced by 1.64 km) (-3%)	**Section 3.2.3**
Access track length	63.5 km	57.8 km (reduced by 5.7 km) (-9%)	
Temporary concrete batch plants	Up to 1 (off Cliffdale Road, Turill)	No change	
Temporary construction compound/laydown areas	Up to 1 (off Cliffdale Road, Turill)	No change	
Connection substation/ switchyard	Up to 1	No change	
Indicative development footprint			
Indicative Development Footprints (Wind Farm and External Transmission Line)	Combined total of 1,599.4 ha, comprised of: • Wind farm: 1,367.4 ha. • External transmission line: 232.0 ha.	Combined total of 1,609.4 ha, comprised of: • Wind farm: 1,365.0 ha. • External transmission line: 244.4 ha. Total combined Indicative Development Footprint increased by 10 ha (+ 0.6%)	**Section 3.2.4**
Indicative Development Footprint – Public Road Upgrades	190.7 ha (includes existing road pavement)	184.7 ha (includes existing road pavement) (reduced by 6 ha) (-3%)	
Schedule of lands	The Mod-1 Project (including pinch point locations relevant to public road upgrades and OSOM haulage route) is located across 599 cadastral lots, the full list provided in the Schedule of Lands in Appendix C1 of the Mod-1 Assessment Report.	The RTS Project (including pinch point locations relevant to public road upgrades and OSOM haulage route) is located across 586 cadastral lots, the full list provided in the Schedule of Lands in **Appendix 2** of this report.	
Preferred transport route and road upgrades			
Over-dimensional (OD) and Heavy Vehicle Access Route	Preferred route identified	No change	**Section 3.2.5**

Project Element	Mod-1 Project (as exhibited in Mod-1 Assessment Report) (2022)	RTS Project (incorporating proposed amendments) (2023)	Reference
Indicative OSOM Haulage Route (between Port of Newcastle and Project site)	Preferred route identified	Minor change – removal of Edderton Road as an alternative route around Denman Bridge. EnergyCo to be responsible for separately assessing and carrying out all road upgrades for the OSOM haulage route from Port of Newcastle to Cassilis.	
Site access points	A combined total of 90 site access points from public roads, comprised of: • Wind Farm: up to 47 site access points. • External Transmission Line: up to 43 site access points.	Reduction of site access points to a new total of 74 site access points from public roads (reduced by 16), comprised of: • Wind Farm: up to 34 site access points. • External Transmission Line: up to 40 site access points.	
Construction details			
Construction hours	• Monday to Friday 7 am to 6 pm. • Saturday 8 am to 1 pm. • Work outside these hours may be required, however this will be limited to activities that are inaudible to residences and other unavoidable works.	No change. Likely to be requirement for out of hours work for activities that once started cannot be stopped e.g. blade lifts and concrete pours. Approval will be obtained from the Planning Secretary prior to commencement of out of hours work in accordance with the conditions of the existing Development Consent.	**Section 3.4.1**
Estimated construction workforce	800 peak workforce	550 peak workforce (reduced by 250) – will be confirmed when a Balance of Plant contractor has been appointed (scheduled for late 2023)	
Estimated construction duration	Approximately 3 years	Approximately 4 years (increase of 1 year)	
Operational details			
Estimated commencement of operation	Progressive commencement of operations from 2025 to 2027	Progressive commencement of operations from 2025 to 2028	**Section 3.4.1**
Estimated operational workforce	47	Approximately 40 (minor decrease)	
Estimated project life	30 years	No change	

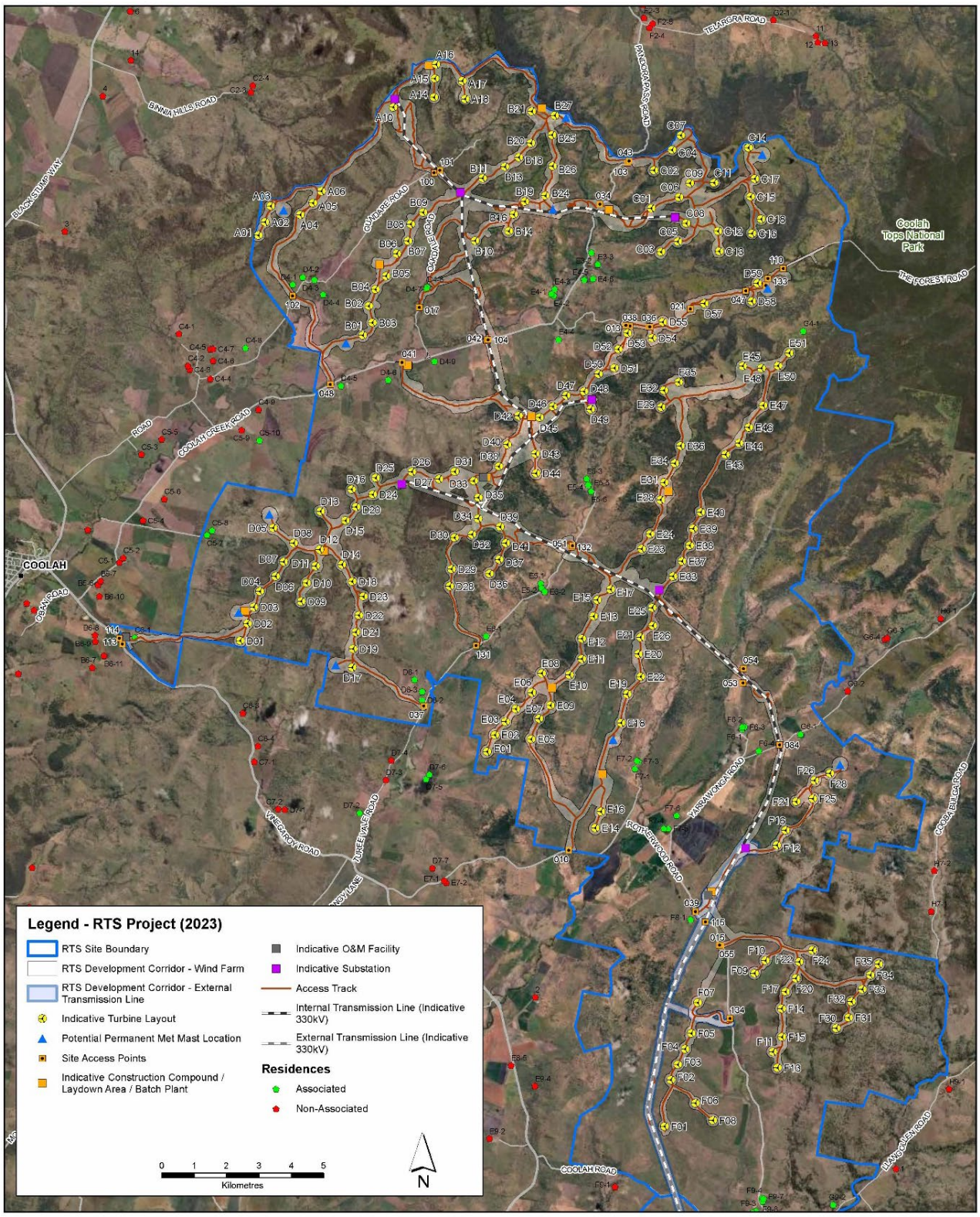


Figure 3.1 RTS Project Infrastructure Layout (northern section)

Source: Tilt Renewables, 2023.

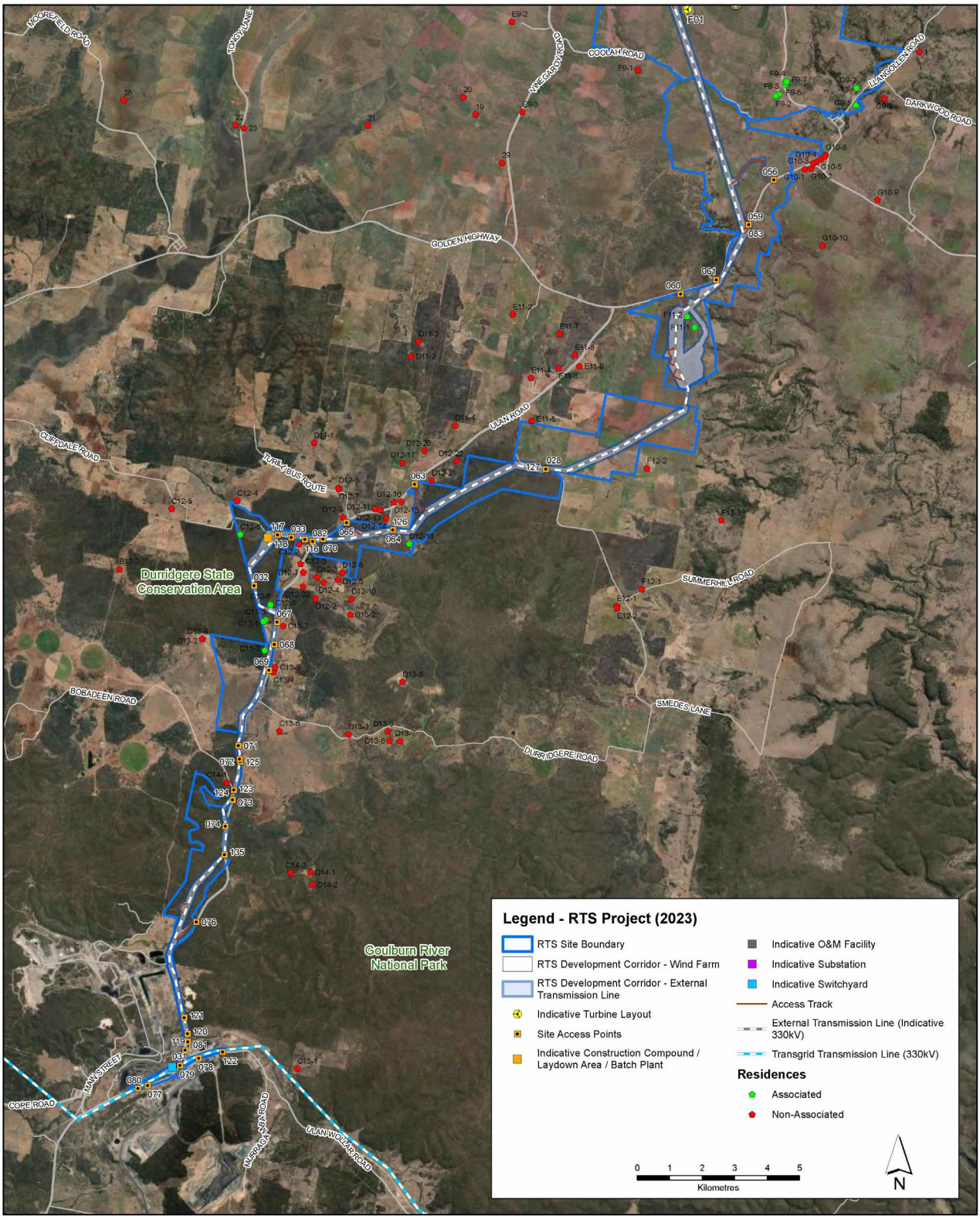


Figure 3.2 RTS Project Infrastructure Layout (southern section)

Source: tilt Renewables, 2023.

3.2 Description of the Amendments

3.2.1 Site Boundary and Development Corridor

The overall site boundary, incorporating the wind farm and external transmission line, has been reduced by 734 ha (-1%) when compared to the Mod-1 Project. This comprises a 7 ha reduction to the wind farm site boundary and a 727 ha reduction of the external transmission line site boundary. The two key changes to the site boundary are shown on **Figure 3.3** and described below:

- Wind farm – removal of a section of unmade road reserve that is under lease by a neighbouring non-associated landholder.
- External transmission line – removal of an area of Durridgere State Conservation Area (DSCA) near Turill to reflect changes in alignment such that this section of the DSCA is avoided.

The amendments have resulted in a substantial reduction in the development corridor when compared to the Mod-1 Project. The RTS Project results in a reduction of 3,883.4 ha (31%) to the total combined development corridor, comprising of 2,994.8 ha reduction (-29%) and 1,365.7 ha reduction (-47%) to the wind farm and external transmission line development corridors, respectively.

The key changes that reduce the development corridor are shown on **Figure 3.4** and **Figure 3.5** and summarised below:

- Removal of turbines and associated infrastructure and access roads.
- Removal of areas of mapped Box Gum Woodland CEEC from both within the wind farm site and along external transmission line wherever practicable to avoid impacts.
- Removal and realignment of access tracks.
- Removal and realignment of sections of overhead 330 kV transmission line.
- Removal and realignment of sections of overhead and underground 33 kV reticulation cabling.

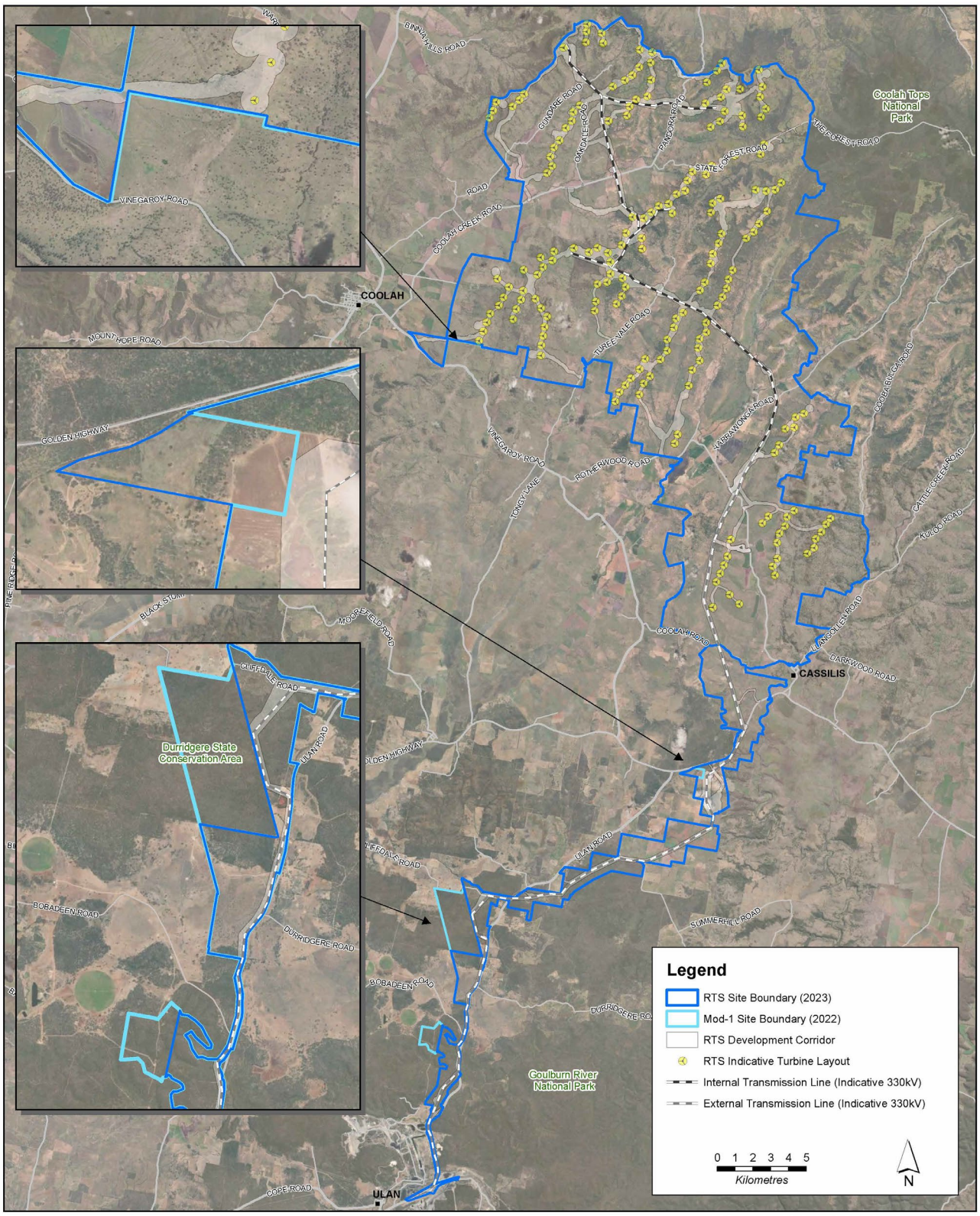


Figure 3.3 Amendments to Project Site Boundary

Source: tilt Renewables, 2023.

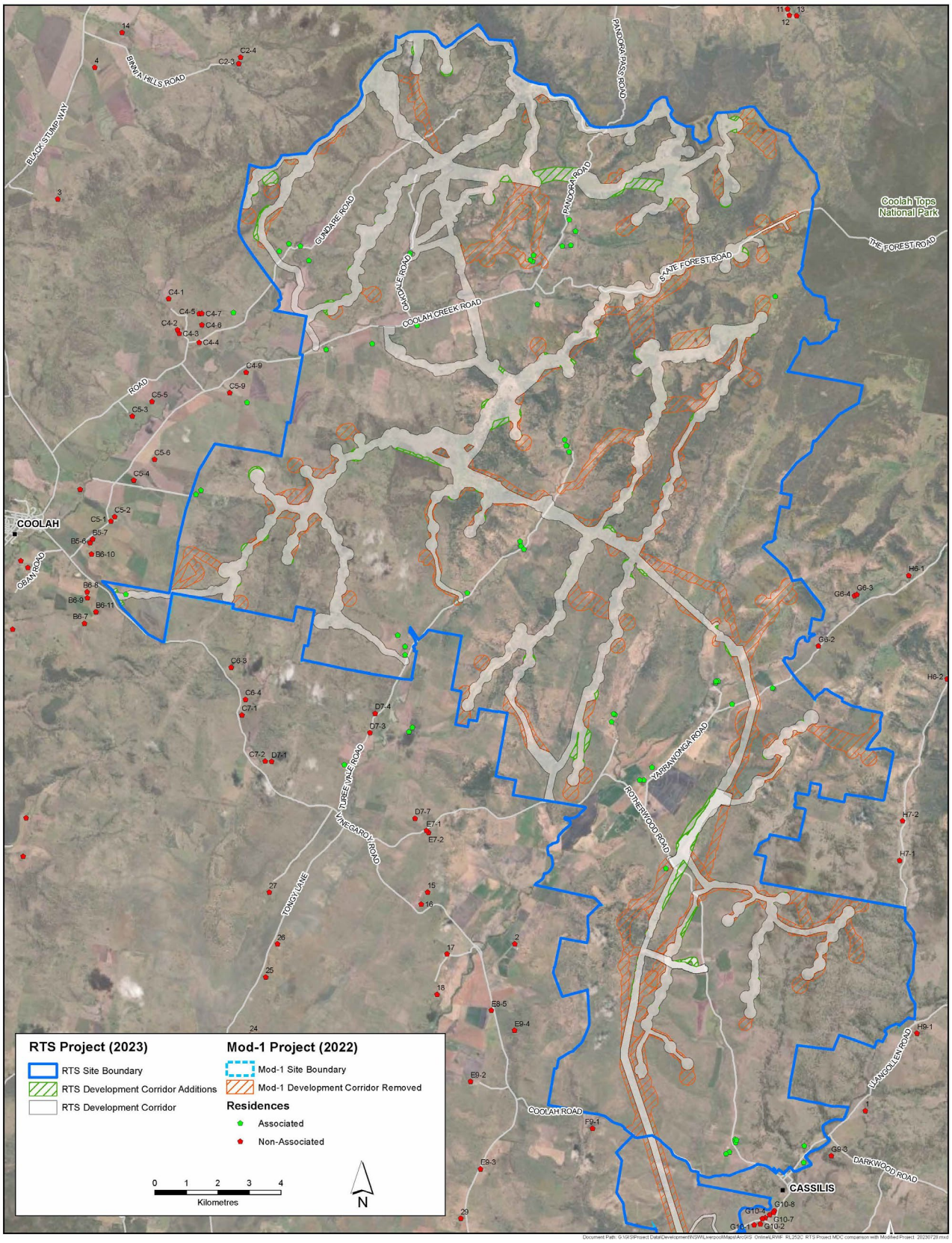


Figure 3.4 Comparison between Mod-1 Development Corridor and RTS Development Corridor (northern section)

Source: tilt Renewables, 2023.

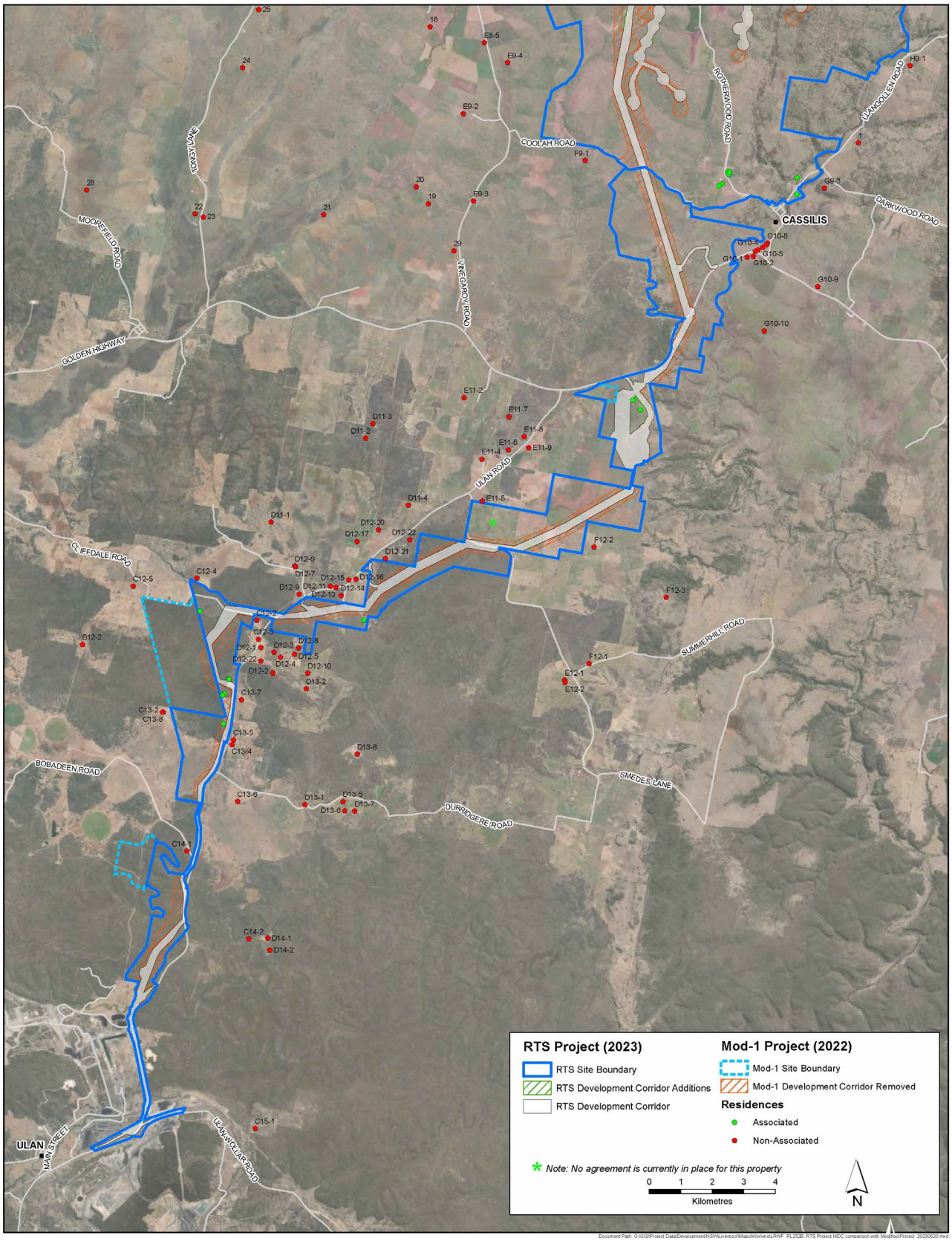


Figure 3.5 Comparison between Mod-1 Development Corridor and RTS Development Corridor (southern section)

Source: tilt Renewables, 2023.

3.2.2 Turbine Parameters and Turbine Layout

Since the exhibition of the Mod-1 Assessment Report, Tilt Renewables has selected Vestas as the turbine supplier, and the turbine model to be installed for the Project is anticipated to be the Vestas V172 7.2 MW turbine. Selection of turbine supplier and model has allowed various turbine parameters to be refined as presented in **Table 3.1,** which has enabled more detailed design to progress. This in-turn has resulted in increased certainty around the extent of potential impacts, including ground disturbance and vegetation clearance, and extent of road upgrades/repairs likely to be required. Selection of the Vestas V172 7.2 MW turbine means that the majority of the physical turbine parameters have reduced from those identified in the Mod-1 Assessment Report. The reduction in certain parameters such as height and rotor swept area have potential benefits in terms of visual impacts and biodiversity impacts.

Since the exhibition of the Mod-1 Assessment Report, Tilt Renewables has also amended the wind farm layout. As discussed in **Section 1.4**, the changes were made to reduce environmental impacts, accommodate landowner requests and as a result of further project design. The key changes include an overall reduction in the number of turbines and increased distances between individual turbines. While multiple turbines were removed from all turbine clusters to, amongst other things, minimise impacts to native vegetation, there was a particular focus on removing turbines within F-Cluster to avoid/minimise impacts to the highest quality areas of Box Gum Woodland CEEC. Three turbines were relocated to avoid impacts to NSW Telco's proposed communication link across the Project site. A summary of the key turbine removals and relocations is provided in **Table 3.2.** GPS coordinates of the RTS Project turbine locations are provided in **Appendix 3**.

Table 3.2 Key turbine removals and relocations

Turbine ID No.	Reason for Removal/Relocation
A7, A8, A9, A11, A12, A13, B22, B23, B28, C10, D56, E30, E41, E42, and E49	Removed to minimise ground disturbance and impacts to native vegetation.
B12, B15 and B17, E19, E27, F18, F23, F27, F29 F36, F37, F38 F39, F40 and F41	Removed to minimise ground disturbance and avoid impacts to Box Gum Woodland CEEC.
C19, C20, C21, D60, D61	Removed to reduce visibility from Pinnacle Lookout, reduce potential turbine noise impacts within Coolah Tops National Park, avoid impacts to a sensitive area of cultural heritage, and avoid impacts to native vegetation.
D40, D43 and E31	Relocated to avoid impact to NSW Telco's proposed communication link across the Project site.

Overall, the number of turbines has been reduced by 35 when compared to the Mod-1 Project. The RTS Project turbine layout is shown in **Figure 3.1**. A comparison of the Mod-1 Project turbine layout with the RTS Project turbine layout is provided in **Figure 3.6**.

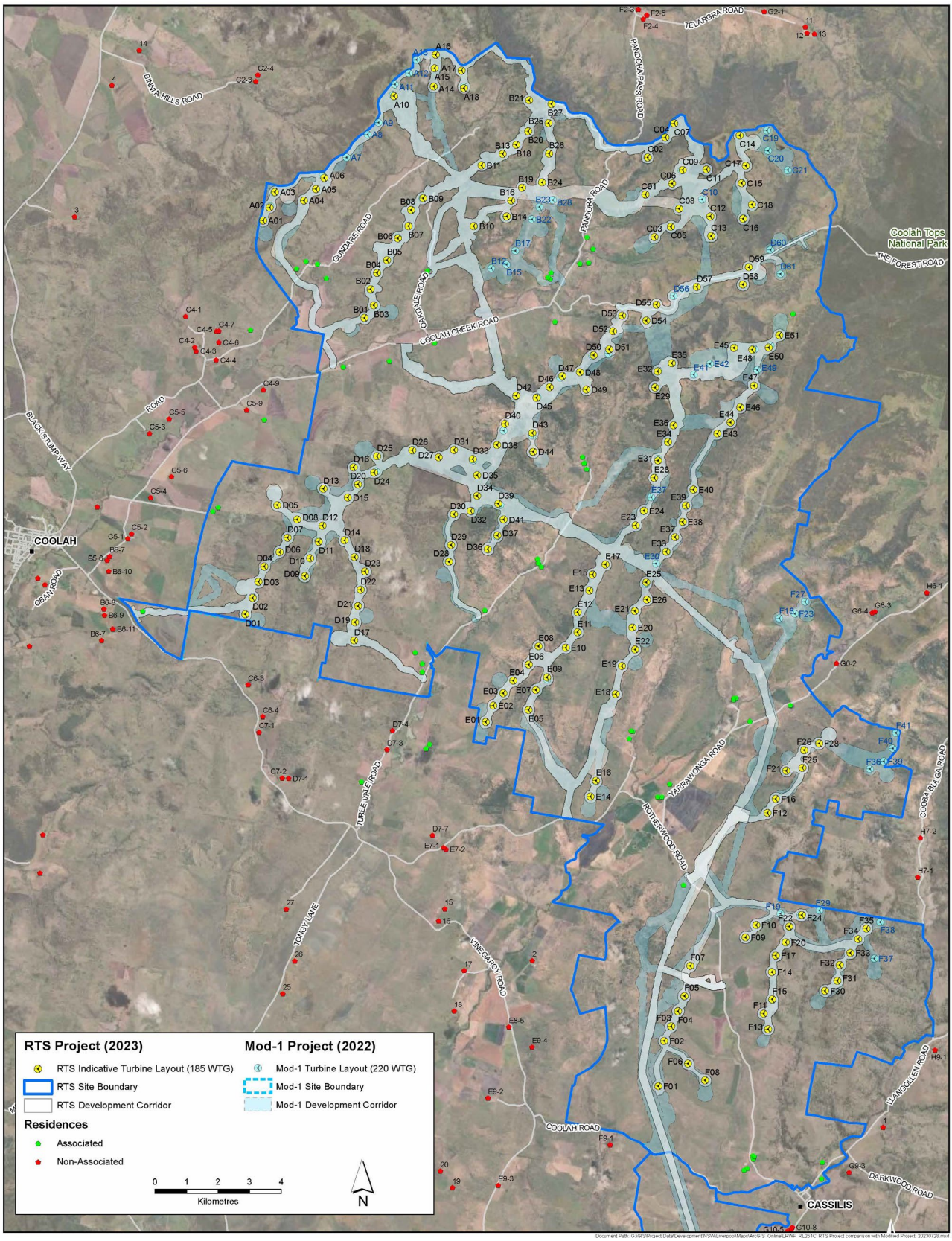


Figure 3.6 Comparison between Mod-1 Project Turbine Layout and RTS Project Turbine Layout

Source: tilt Renewables, 2023.

3.2.3 Ancillary Infrastructure

3.2.3.1 Wind Farm Ancillary Infrastructure

Changes to ancillary infrastructure as described for the Mod-1 Project are generally a result of further design effort and were made to ensure constructability, reduce potential environmental impacts, and ensure efficient operational performance.

The maximum number of collector substations remains unchanged at 7, however some revisions have been made to their location, size, and orientation. Relatedly, several changes have also been made to the internal transmission line alignment that provides a connection between the collector substations, resulting in a reduction in length of 2.2 km. These changes to the substation and internal transmission line infrastructure layout have been largely driven by a requirement to reduce impacts to Box Gum Woodland CEEC, respond to landholder concerns, and achieve minimum operational requirements.

The proposed layout changes, including removal of duplicate site access points and access tracks from public roads, have resulted in a reduction in the total length of internal wind farm access track by approximately 13.5 km.

The maximum number of permanent meteorological masts has been reduced by four, down to a maximum of 10. The three O&M facilities remain the same at three indicative locations. The locations of the ancillary infrastructure proposed by the RTS Project is shown in **Figure 3.1** and **Figure 3.2**. A comparison of the ancillary infrastructure between the Mod-1 Project and RTS Project is shown in **Figure 3.7**, noting that the only key change to the external transmission line is a minor realignment to avoid impacts to a section of Durridgere State Conservation Area.

There is no change to the number of temporary concrete batch plants and construction laydown areas (up to nine within the wind farm and one along the external transmission line) required for the RTS Project. The number of indicative locations of these facilities has been reduced (from 18 down to 13 within the wind farm and no change along the external transmission line).

The length of underground reticulation cabling has decreased from 196.4 km to 173.5 km. This is the result of the deletion of several turbines, and more detailed design that is constructable and allows for some reduction in environmental and social impacts, where possible.

The number of temporary calibration met masts has been reduced from a potential 28 to a maximum of 10. This reduction has been made possible due to the selection of a preferred turbine (Vestas V172 7.2 MW) and refinement of the turbine layout including multiple turbine deletions. The precise quantity and location of these masts will be determined through further consultation with the turbine supplier and detailed electrical performance modelling for the preferred turbine.

3.2.3.2 External Transmission Line and Connection Infrastructure

In addition to the reduced external transmission line development corridor discussed in **Section 3.2.1**, the RTS Project results in a reduction of 1.64 km of length of the external transmission line. This is a result of removal of previously identified optional (duplicate) sections of the alignment (refer to item 43 on **Figure 1.4**). There is also a reduction in access track length to or within the transmission line easement of 5.7 km.

In the event the delivery timeframes for the CWO REZ transmission line align with the Liverpool Range Wind Farm project, approval is being sought to connect the Project into the CWO transmission line proposed by EnergyCo. The proposed CWO REZ transmission line would extend from the Merotherie Energy Hub to the substation proposed in the F Cluster off Rotherwood Road, Cassilis, as discussed in **Section 2.2.** In the event the Project connects into the CWO REZ transmission line, the approved external transmission line connection to Ulan would no longer be required and all associated impacts would no longer apply.

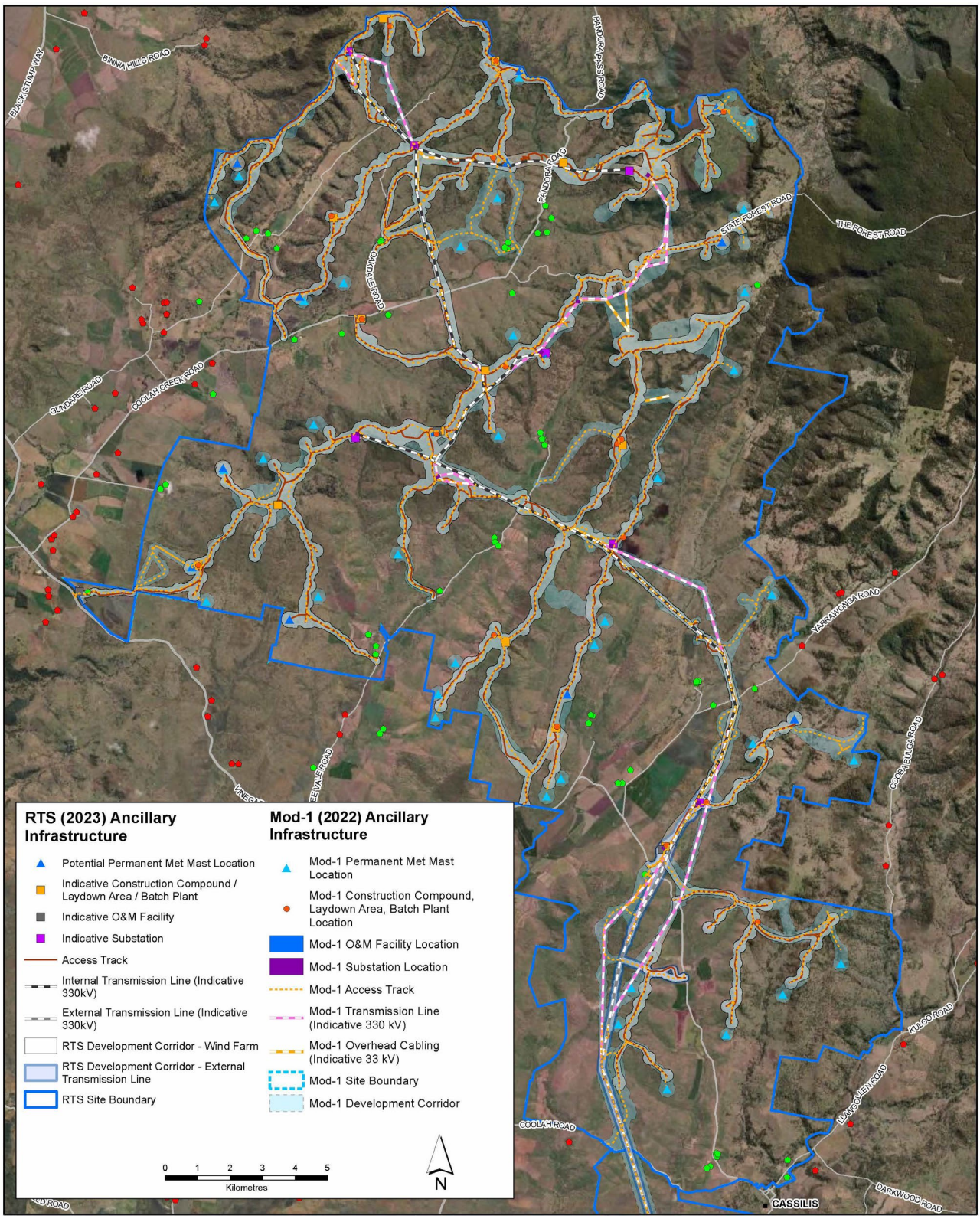


Figure 3.7 Comparison between Mod-1 Project and RTS Project Ancillary Infrastructure Layout

Source: tilt Renewables, 2023.

3.2.4 Indicative Development Footprint

The indicative development footprint includes all temporary and permanent ground disturbance and vegetation clearance required to construct the wind farm, external transmission line, and public road upgrades.

The wind farm indicative development footprint has reduced by 2.4 ha (0.1%) when compared to the Mod-1 Project.

The external transmission line indicative development footprint has reduced by 12.4 ha (5.3%) when compared to the Mod-1 Project. As only a minor change has been made to the external transmission line alignment (see Item 43 in **Figure 1.4**), the change in indicative development footprint for the external transmission line is due in main part to a combination of updated vegetation mapping and revised methodology used to assess partial direct impacts within the transmission line easement. As detailed in **Section 6.4.1,** following consultation with BCS revisions were made to the criteria and methodology used in the updated BDAR to assess partial direct impacts in a manner that is consistent with the approach adopted by EnergyCo for its proposed transmission line infrastructure within the CWO REZ.

Further design work undertaken for the RTS Project has identified a minor reduction (6 ha) of the area required for local public road upgrades. The total area of public road upgrades has reduced to 184.7 ha.

3.2.5 Preferred Transport Route and Road Upgrades

The only material change proposed to the Over-dimensional (OD) and Heavy Vehicle Access Route (as defined in Development Consent) for the RTS Project is the removal of Coolah Road from the Project such that no light, heavy or OSOM vehicles would be permitted to use Coolah Road during construction. For site access there would be a reduction from 90 access locations to 74.

With regard to required road upgrades, there would be several changes as determined through consultation with WSC and UHSC. A detailed audit of the existing conditions of all public roads, intersections, and major structures potentially affected during the construction and operational phase of the Project was undertaken in October 2022. The proposed upgrade and repair treatments are based on the current anticipated traffic volumes and proposed access routes for constructing the wind farm. As agreed with councils, treatments include the removal of the existing pavement seal along short segments of Pandora Rd, Turee Vale Rd and Rotherwood during construction, with a final pavement seal to be reapplied prior to hand-back to the relevant road authority when that road is no longer required for construction.

Detailed descriptions of the changes to site access and road upgrades are presented in the Supplementary Traffic Impact Assessment (refer to **Appendix 10**).

As the Project is located within the CWO REZ, and recognising that Tilt Renewables is a Candidate Foundation Generator (CFG) within the CWO REZ, EnergyCo and TfNSW have committed to undertake all upgrades to the State Road network required to facilitate OSOM movements between the Port of Newcastle and the Project site. There is one minor amendment to the proposed OSOM haulage route, the removal of Edderton Road as an optional route around Denman Bridge in Denman.

3.2.6 Definition of Commissioning

Under the Development Consent, several management plans, most notably the bird and bat adaptive management plan (BBAMP) must be prepared prior to commissioning the wind farm. The term commissioning is not currently clearly defined in the Development Consent, and the Applicant is seeking approval to address this. It is considered that the term "commissioning" should refer to the commencement of formal Hold Point Testing in accordance with the requirements specified by EnergyCo for the Central-West Orana Renewable Energy Zone. This is a clear and transparent definition that sets out a trigger point that can readily be identified and enforced, and is consistent with the definition that has been accepted by the Commonwealth Department of Climate Change, Environment, Energy and Water (DCCEEW) as part of the approvals pathway required for the RTS Project under the *Environment Protection and Biodiversity Conservation Act 1999*.

3.3 Comparison of Approved Project and RTS Project

The EP&A Act requires that the application to modify the Development Consent be assessed in light of the nature and extent of the changes proposed to the Approved Project as part of the modification application. This section provides a comparison of the changes proposed to the Approved Project by the updated RTS Project the subject of the modification application. The changes for each of the key Project elements from the Approved Project to the RTS Project are presented in **Table 3.3**. Changes to the turbine layout and other key ancillary infrastructure from the Approved Project to the RTS Project are presented in **Figure 3.8**, **Figure 3.9**, and **Figure 3.10** respectively.

Table 3.3 Comparison between Approved Project and RTS Project

Project Element	Approved Project (2018)	RTS Project (2023)	Change from Approved Project to RTS Project
Site boundary and development corridor			
Site boundary area	51,336 ha	51,389 ha comprised of: • 46,532 ha (wind farm) • 4,857 ha (external transmission line).	Increase by 53 ha (-0.1%)
Development corridor	12,405 ha	8,718.2 ha comprised of: • 7,322.3 ha (wind farm) • 1,540.5 ha (external transmission line).	Decrease by 3,686.8 ha (-30%)
Turbine parameters and wind farm layout			
Maximum Number of turbines	267	185	Decrease by 82 (-31%)
Maximum blade tip height (AGL)	165 m	215 m	Increase by 50 m (+30%)
Indicative hub height	100 m	129 m	Increase by 29 m (+29%)

Project Element	Approved Project (2018)	RTS Project (2023)	Change from Approved Project to RTS Project
Indicative rotor diameter	130 m	172 m	Increase by 42 m (+32%)
Indicative minimum blade ground clearance	35 m	40 m	Increase by 5 m (+14%)
Indicative rotor swept area (RSA) per turbine	13,273 m^2	23,235 m^2	Increase by 9,962 m^2 (+75%)
Indicative total RSA for wind farm	3,543,891 m^2	4,298,475 m^2	Increase by 754,584 m^2 (+21%)
Total generating capacity	961 MW (based on 3.6 MW turbine)	1,332 MW (based on 7.2 MW turbine)	Increased by 371 MW (+39%)
Ancillary infrastructure			
Wind farm access track length	256.5 km	246.4 km	Decrease by 10.1 km (-4%)
Internal transmission line length	28.19 km	41.7 km	Increase by 13.51 km (+48%)
Reticulation cabling length	Underground: 274.1 km Overhead line: 46.7 km	Underground: 173.5 km	Decrease by 100.6 km (-37%)
Permanent PCV met masts	Up to 10	Up to 10	No change
Collector substations	Up to 4	Up to 7	Increase by 3
O&M facilities	1	Up to 3	Increase by 2
Temporary site calibration met masts	Not specified	Up to 10	-
Temporary concrete batch plants	Up to 4	Up to 9	Increase by 5
Temporary construction compound/laydown areas	Up to 6	Up to 9	Increase by 3
External transmission line and connection infrastructure			
External transmission line length	56.82 km	54.6 km	Decreased by 2.2 km (-4%)
Access track length	56.8 (based on mapping from original EIS)	57.8 km	Increased by 1 km (+2%)
Temporary concrete batch plants	Up to 1 (Ulan connection point)	Up to 1 (off Cliffdale Road, Turill)	No change
Temporary construction compound/laydown areas	Up to 1 (Ulan connection point)	Up to 1 (off Cliffdale Road, Turill)	No change
Connection substation/switchyard	Up to 1	Up to 1	No change

Project Element	Approved Project (2018)	RTS Project (2023)	Change from Approved Project to RTS Project
Indicative development footprint			
Indicative Development Footprints (Wind Farm and External Transmission Line)	Combined total of 752.82 ha	Combined total of 1,609.4 ha, comprised of: • Wind farm: 1,365.0 ha. • External transmission line: 244.4 ha.	Increase by 856.6 ha (+ 113%)
Indicative Development Footprint – Public Road Upgrades	Not assessed in original EIS	184.7 ha (includes existing road pavement)	-
Preferred transport route and road upgrades			
Over-dimensional (OD) and Heavy Vehicle Access Route	Preferred route identified	Revised preferred route with minor changes	-
Indicative OSOM Haulage Route (between Port of Newcastle and Project site)	Preferred route identified	Minor change – removal of Edderton Road as an alternate route around Denman Bridge. EnergyCo to be responsible for separately assessing and carrying out all road upgrades for the OSOM Haulage Route from Port of Newcastle to Cassilis.	-
Construction details			
Construction hours	• Monday to Friday: 7 am–6 pm • Saturday: 8 am–1 pm • Sunday and public holidays: no work proposed.	No change Likely to be requirement for out of hours work for activities that once started cannot be stopped e.g. blade lifts and concrete pours. Approval will be obtained from the Planning Secretary prior to commencement of out of hours work in accordance with the conditions of the existing Development Consent.	-
Estimated construction workforce	829	Approximately 550 peak workforce	
Estimated construction duration	-	Approximately 4 years	
Operational details			
Estimated operational workforce	Up to 78	Approximately 40	Decrease by 38
Estimated project life	Approximately 30 years	Approximately 30 years	No change

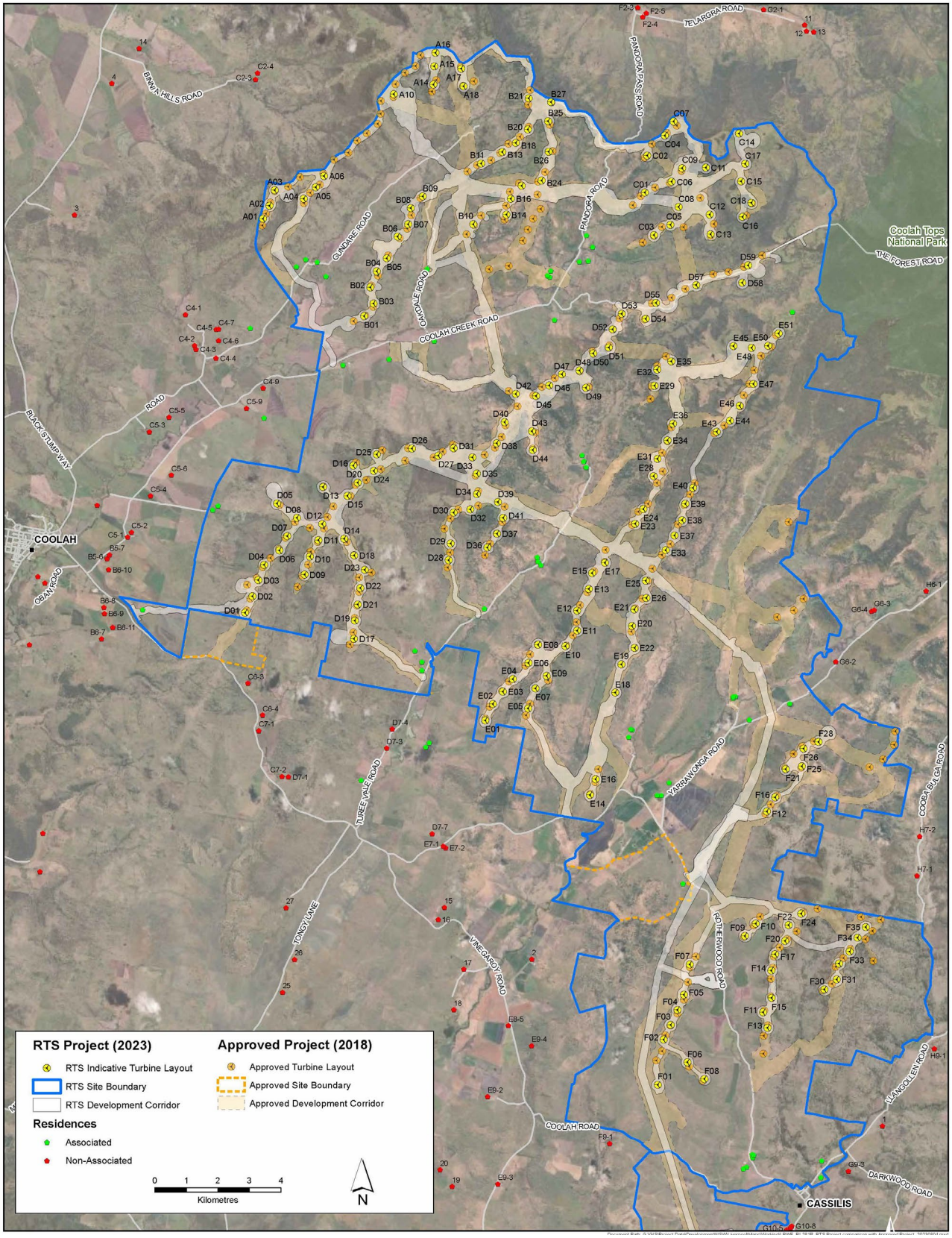


Figure 3.8 Comparison between Approved Project Turbine Layout and RTS Project Turbine Layout

Source: tilt Renewables, 2023.

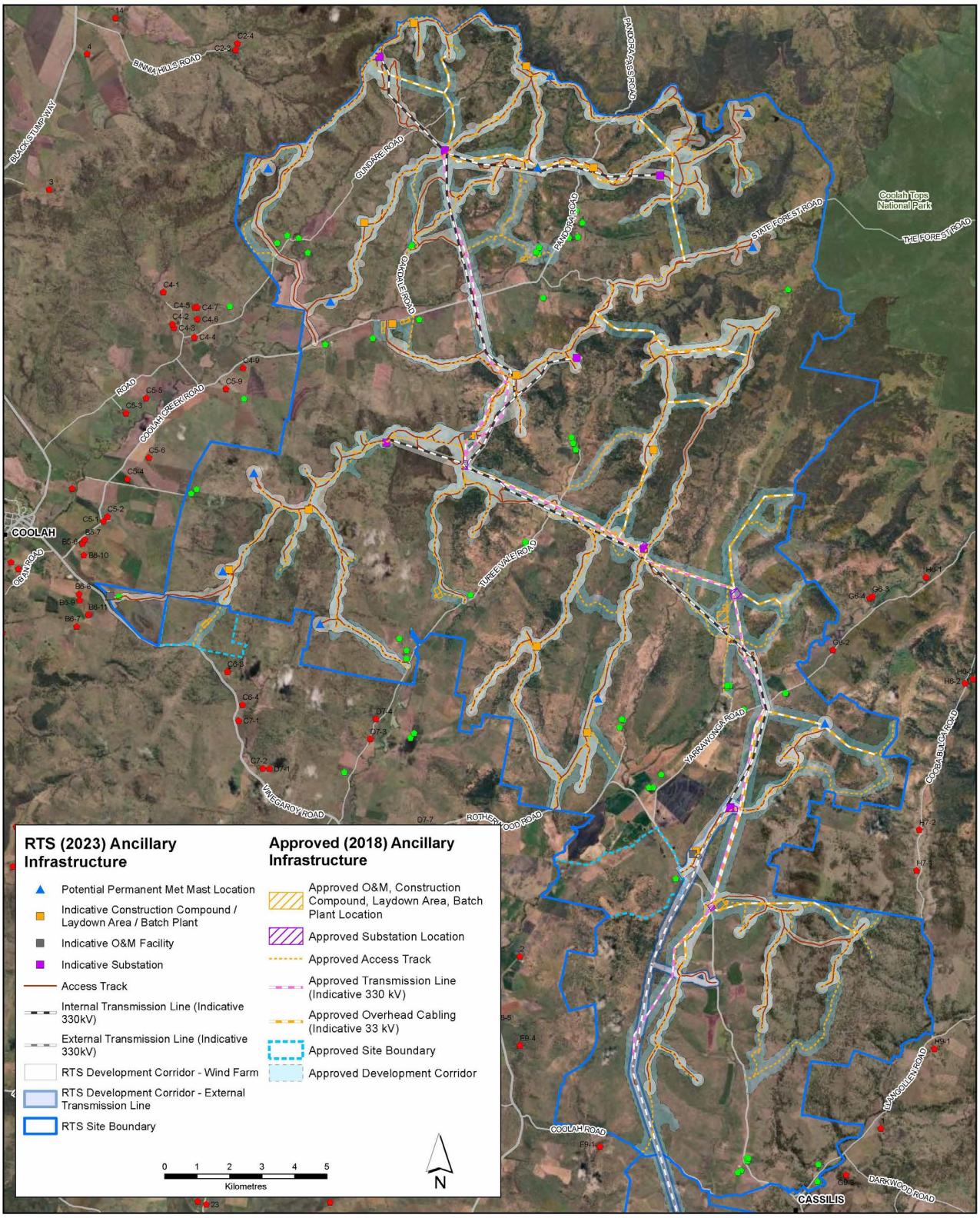


Figure 3.9 Comparison between Approved Project and RTS Project Ancillary Infrastructure (northern section)

Source: tilt Renewables, 2023.

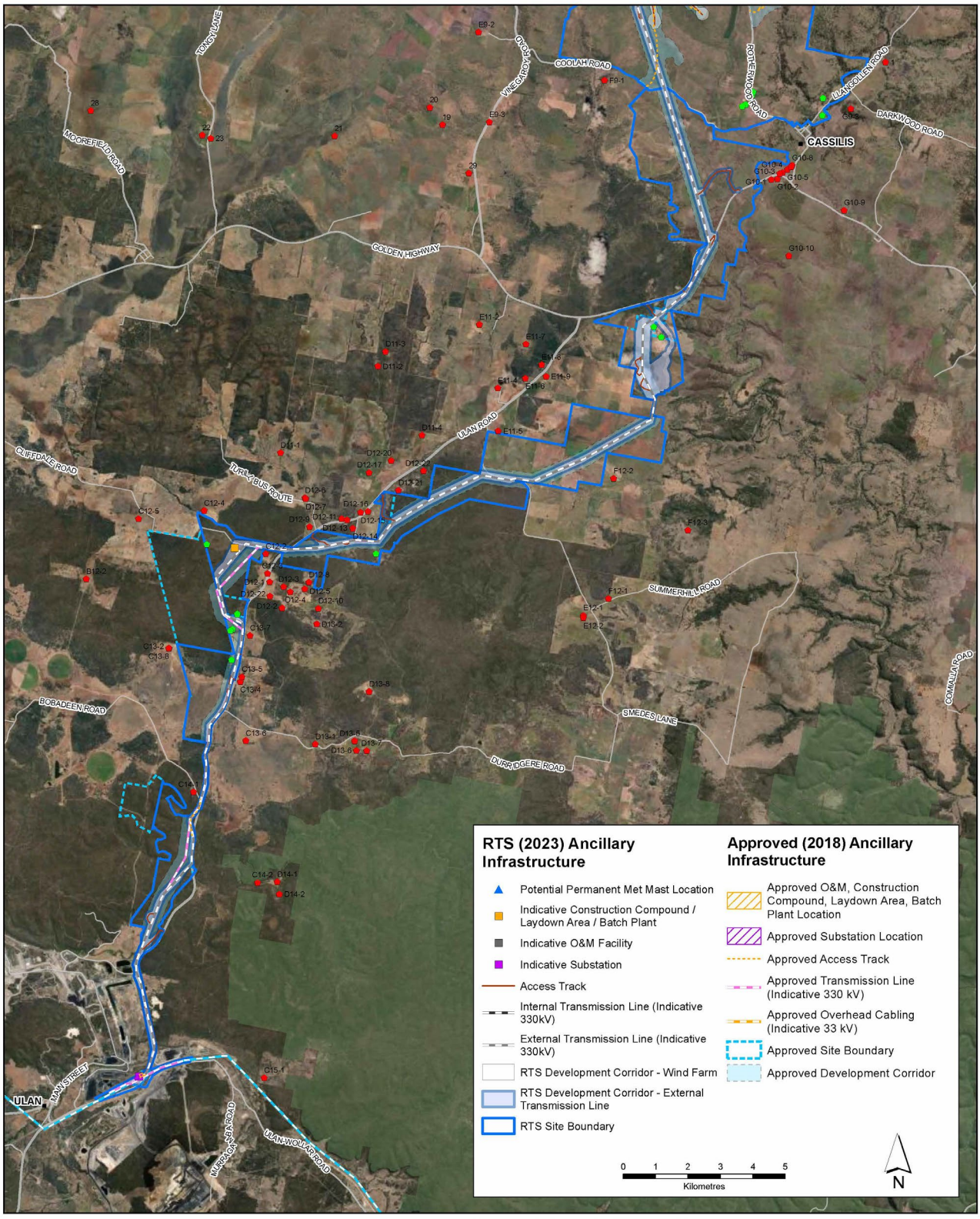


Figure 3.10 Comparison between Approved Project and RTS Project Ancillary Infrastructure (southern section)

Source: tilt Renewables, 2023.

3.4 Other Changes

As a result of the substantial detailed design work that has been completed for the RTS Project a series of other changes are required to construct the project in a timely and efficient manner. These changes do not form part of this current modification application and are provided below for information purposes. These are discussed in the sub-sections below.

3.4.1 Construction and Operational Workforce

The key changes relevant to construction from the Mod-1 Project to the RTS Project are the revision of the peak workforce estimate from approximately 800 people to approximately 550 people and the change to estimated construction timeframe from three years to four years.

There are very minor operational changes from the Mod-1 Project to the RTS Project. There is a small decrease in the estimated operational workforce from 47 people to 40 people as well as an increase in the period of progressive operation of the wind farm from three years until fully operational to four years until fully operational.

3.4.2 Temporary Workforce Accommodation

It is estimated that a peak workforce of approximately 550 will be required during the construction phase. There will be a ramp-up and ramp-down from that peak workforce number as construction progresses and winds down respectively.

Given the remote location and lack of short- and long-term rental properties within a one-hour drive of the Project, a temporary workforce accommodation (TWA) facility is likely to be required. This is supported by the findings of the Accommodation and Employment Framework (AEF) that was prepared for the RTS Project (Umwelt 2023) and advice received from several major construction companies. The TWA should be sited, located and sized appropriately to attract and maintain the workforce required over the approximately four year construction period.

Acknowledging the shortage of short- and long-term accommodation in the region, Tilt Renewables has identified several potential sites close to the Project site within both UHSC and WSC LGAs for a TWA facility. Tilt Renewables is working closely with various State government agencies, local councils, and relevant landholders to undertake due diligence assessments on these sites and to determine the most appropriate approvals pathway and assessment requirements. Over the coming months, Tilt Renewables will consult with the local communities to provide information on all shortlisted potential sites, available design solutions, legacy infrastructure opportunities and potential approvals pathway, and seek feedback that could inform how the TWA could be sited, designed, assessed and operated in a manner that minimises impacts and maximises benefits for the local communities. All necessary approvals will be obtained to construct and operate the TWA throughout the construction phase.

3.4.3 Quarry Material

Following more detailed design work that has been completed for the RTS Project there is now much more certainty on the extent of public road upgrades/repairs and bulk earthworks and the associated rock, gravel, and sand quantities required to construct the Project. Substantial volumes of suitable rock, gravel and sand will be required during construction of the wind farm. Tilt Renewables have identified a potential quarry site located off Rotherwood Road at Cassilis. A quarry at this location would provide the benefit of nearby resources for construction of access roads and providing materials for road upgrades and provide a source of gravel.

Significant geotechnical investigations have been completed on-site and it is estimated that there is adequate supply of appropriate rock, gravel and sand material that can be sourced from within the Project site. Recent intrusive investigations have identified a potential quarry site in the southern portion of the Project site off Rotherwood Road that could provide suitable rock, gravel and sand material for the public road upgrades/repairs and wind farm construction activities.

It is intended that the quarry operations would be Project-specific and temporary, and sited, designed and operated in a manner that minimises impacts as far as practicable and results in benefits to the local community. Key benefits of locating a quarry and winning suitable rock, gravel and sand material within the Project site are likely to include avoiding the need to transport large quantities of quarry material from significant distances to the Project site, which in effect would reduce the number of quarry vehicles and distance travelled on the broader road network, which would in-turn lead to improved road safety outcomes.

Tilt Renewables is working closely with various State government agencies to determine assessment requirements and the most appropriate approvals pathway for the quarry. Over the coming months, Tilt Renewables will consult with local communities to seek feedback on the potential quarry site and expected quarry operations, findings of the geotechnical investigations completed to-date, potential impacts and mitigation measures, and potential approvals pathway. All necessary approvals will be obtained before quarry operations commence.

3.4.4 Construction Water

Tilt Renewables has progressed discussions with landowners in regard to construction water sources and use of water licence allocations for concrete batch plant operations, dust suppression and other uses. Approximately 627 ML of water is estimated to be required over the entire construction phase of the Project, and is expected to be sourced from multiple bores and licences within or nearby to the Project site. Tilt Renewables have identified potential water source locations for existing and proposed new groundwater bores. Tilt Renewables will shortly commence the licencing process for these bore locations. Bore investigations and associated licences required for the initial phases of construction are being prioritised first, and additional bores and licences will be sourced as required as the construction phases progress.

4.0 Statutory Context

4.1 NSW Assessment and Approval Process

The Project was approved by the Department of Planning and Environment (DPE) under delegation for the NSW Minister for Planning on 27 March 2018. The Project is State Significant Development approved under Section 4.38 of the EP&A Act. The State Significant Development Consent SSD-6696 authorises the construction, operation and decommissioning of up to 267 turbines with a maximum blade tip height of 165 m AGL, and associated infrastructure, subject to detailed conditions.

Following Tilt Renewables purchase of the Project from Epuron Pty Ltd in 2019, Tilt Renewables undertook a design review and optimisation process as part of progressing the Project to construction. As a result of this process a modification application (Mod-1) under Section 4.55(2) of the EP&A Act was submitted to DPE in September 2022. The Mod-1 Assessment Report was placed on public exhibition from 20 September to 17 October 2022. During the exhibition period, members of the community and interested stakeholders and were able to review the Mod-1 Assessment Report and make a written submission to the DPE for consideration in its assessment of the Project.

This Amendment Report has been prepared in line with clause 113 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) which states that an application may, with the approval of the Planning Secretary, be amended at any time before the application is determined. The Planning Secretary has been advised of Tilt Renewables' intention to amend the Project with this Amendment Report describing the proposed Project amendments and assessing the associated environmental impacts.

4.2 Commonwealth Assessment and Approval Process

A referral (EPBC 2014/7136) under the *Environmental Protection and Biodiversity Act 1999* (EPBC Act) was initially made for the Project in February 2014. The Project was determined to be a controlled action requiring assessment and approval under the EPBC Act in March 2014. The relevant controlling provisions included listed threatened species and communities (Sections 18 and 18A) of the EPBC Act.

The Project was granted Commonwealth approval under the EPBC Act, subject to conditions, on 29 June 2018. The approval was granted to Epuron Pty Ltd who were the original developers of the Project (Action). On 2 May 2019 the approval was transferred to Liverpool Range Wind Farm Pty Ltd.

Following discussions with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) in 2020 and 2021, a re-referral (EPBC 2022/09416) of the Project (Action) was lodged with DCCEEW in November 2022 to enable the changes proposed to the Approved Project as part of Mod-1 to be assessed under the EPBC Act (Mod-1 Referral). On 30 March 2023 the re-referral was determined to be a controlled action with the relevant controlling provisions being listed threatened species and communities, and listed migratory species. The Mod-1 Referral will be updated to reflect the further changes now proposed as part of the RTS Project prior to being assessed by public environment report under the EPBC Act.

5.0 Stakeholder Engagement

This section outlines community and stakeholder engagement carried out during and following exhibition of the Mod-1 Assessment Report.

5.1 Consultation to Support Mod-1 Public Exhibition

The Mod-1 Assessment Report was placed on public exhibition by DPE from 20 September to 17 October 2022. The exhibition period provided stakeholders with an opportunity to review the Assessment Report and, if they chose, make a submission to DPE.

The Mod-1 Assessment Report was publicly available on DPE's Major Projects website. In addition, hard copies of the Mod-1 Assessment Report were publicly displayed at the offices of Warrumbungle Shire Council and Upper Hunter Shire Council as well as at the dedicated Project Shopfront space that was leased for the public exhibition period at 50 Binnia Street, Coolah.

Newspaper advertisements advising of exhibition of the Mod-1 Assessment Report were placed in the Sydney Morning Herald, the Coolah Diary, Dunedoo Diary, Mudgee Guardian, Dubbo Daily Liberal, Cessnock Advertiser, Newcastle Herald, Hunter Valley News and the Singleton Argus newspapers. Radio announcements were also made to support the promotion of the public exhibition period with the local station, 3 Rivers Radio, as well as an interview on ABC Radio – Hunter region. Advertisements were also placed in community newsletters such as the Regional Development Orana and direct email to the Project database.

Furthermore, notifications were placed in accordance with Multiple Owners Designation notification requirements in September 2022, in the Sydney Morning Herald, Coolah Diary, Mudgee Guardian, Dubbo Daily Liberal, Cessnock Advertiser, Newcastle Herald, Hunter Valley News and the Singleton Argus newspapers. The following communication materials continued to be available during the EIS exhibition period:

- project website – www.liverpoolrangewindfarm.com.au
- project email address – liverpoolrangewindfarm@tiltrenewables.com
- free call contact number – 1800 WE TILT (934 458)
- project fact sheets – all downloadable via the website.

5.2 Consultation During Development of the Amendments

Following exhibition of the Mod-1 Assessment Report, consultation and engagement activities were undertaken with a range of stakeholders including directly impacted land holders, local residents, government authorities, local councils, utilities owners, and community groups. Details of the consultation and key items of discussion are presented in **Section 5.2.1** and **Section 0**.

5.2.1 Community Consultation

Details of consultation undertaken during development of the amendments is presented in **Table 5.1**.

Table 5.1 Consultation with community groups and individuals during development of the amendments

Groups/Individuals	Dates	Issues discussed
Community Groups		
Community facilities – hosting project information material	Throughout October and November 2022	Project fact sheets were made available at the Coolah Library, Coolah, Dunedoo and Cassilis Post Offices, and at the Warrumbungle Shire Council office in Coolah. The dedicated Project Shopfront space that was leased for the public exhibition period at 50 Binnia Street, Coolah was home to all Mod-1 Project information.
Coolah District Development Group (CDDG) meeting	25 October 2022	Covered consultation and feedback on engagement methods and structure of community benefit sharing approach.
Rural Guide 2023	21 November 2022 (published)	Relevant for year 2023 – inclusion of LRWF advertisement to promote Goods & Services Register and employment opportunities during construction.
Group meeting: Coolah and Cassilis District Development Groups, LRWF CCC community representatives, Warrumbungle Shire Councillor, Dunedoo Coolah Landcare, EnergyCo CRG community representative	30 November 2022 – Coolah Youth Hall, 2.5 hr workshop	Community workshops – kick off meeting with targeted combination of community groups to discuss plan for a co-design workshop series to influence benefit sharing outcomes and commitments.
Coolah Diary Fortnightly Advertisements	Multiple dates (2 ads per month and 2 sponsored ads per month), covering October 2022–July 2023 (ongoing).	Ads covered general Project information, links to newsletter subscription, Goods & Services Register, planning processes, and other important / timely information.
LRWF Project Newsletter	December 2022 edition	Content covered a report back from public exhibition – summary, planning process, look ahead to 2023, benefit sharing, active in the community.
Mudgee Guardian	December 2022	Half page ad promoting the newsletter.
Dubbo Daily Liberal	December 2022	Half page ad promoting the newsletter.
RDA Orana newsletter	December 2022	E-newsletter ad promoting the LRWF newsletter.
Coolah District Development Group	December 2022	Discussions with Coolah DDG members about engagement with Gilgandra LALC.
Ash Group Holdings – First Nations business	17 & 30 January and 13 April 2023	Workforce accommodation options and benefit sharing discussion.

Groups/Individuals	Dates	Issues discussed
Coolah District Development Group	January – February 2023	Made contact with Taralga Wind Farm and Upper Lachlan Shire Council to connect the CDDG with a community representative on the Taralga Wind Farm Community Enhancement Fund Committee to learn about how it works and what community representation looks like.
Project shopfront – official opening	15 February 2023 Ongoing opening hours: Tues–Thurs, 8.30 am–4.30 pm	Opening event – daytime catered BBQ promoted to full stakeholder list, attended by ~40 community members. Opportunity to speak with Project team.
Re-Alliance – CWO REZ Industry Roundtable	17 February 2023 20 June 2023	Discussion on the future of community benefits in the CWO REZ and opportunity for proponents to come together and share Project status, assess coordination.
Western magazine	21 February 2023	Advertisement promoting employment on the Project and Goods & Services Register.
Inland Growth Summit (sponsorship) and Orana Outlook Dinner	20–22 February 2023	Tilt was one of the event sponsors. Goods & Services Register ad included in all showbags. Industry networking event – seeking opportunities for benefit sharing, procurement, partnerships.
RDA Orana newsletter	25 February 2023	E-newsletter ad promoting the Goods & Services Register.
NSW ICC – First Nations businesses – procurement	27 February 2023	Membership discussion.
EPBC Referral – open for public comment	2–17 March 2023	Promotion of the Referral including where to find information and provide comment. Ad in Coolah Diary, emails to stakeholder database, Project website update and public noticeboards.
Active Farmers Dunedoo	3 March 2023	Discussion to support (sponsorship opportunity) Dunedoo Active Farmers event – mental and physical health initiative for farmers.
Native Secrets – First Nations business	24 March 2023	Meeting to discuss partnership to manage biodiversity offset sites.
Community Consultative Committee (LRWF CCC) meeting	May 2023	Presented RTS Project – key information to the CCC and provided a broad update on activity over the past 6 months.
RDA Orana Resources, Energy & Industry Innovation Forum	6–8 June 2023	Presented on the Project and how it fits into the REZ. Opportunity to discuss the Project with local industry.

Groups/Individuals	Dates	Issues discussed
Renewables in Agriculture conference	21 June 2023	Sponsor of the event with a stall. Opportunity to speak with farmers and industry about the Project.
LRWF project newsletter	June 2023 edition	RTS focus.
LRWF landholders - townhall	5 July 2023	Project update to all involved landholders.
WAAP employment event	27 July 2023	Project information stand with a focus on discussing employment, goods and services.
Individuals		
Landholders (Dwellings #H6-2, #H6-3, #G6-3, #G6-4, #C5-9, #C6-4, #H7-1, #G6-2	Telephone calls + written correspondence. Various dates since June 2022	Potential visual impacts (specific to dwelling location). Consultation based on seeking access for black-line visual impact assessment.
Landholder (Dwelling #C6-3)	Various attempts to make contact: • 12 December 2022: Phone call. • 16 December 2022: Phone call. • 21 December 2022: Sent letter to residence. • 18 January 2023: Attended residence. • 31 January 2023: Attended workplace and left message. • 1 February 2023: Dropped letter into workplace and registered mailbox. • Invited to shopfront opening.	Potential visual impacts (specific to dwelling location).
Landholder (Dwelling #3)	Telephone calls + in person meeting (17/11/22) and various correspondence	Potential impacts to Farming Operations, potential Impacts to local road network in proximity to other land owned and potential impacts to local workforce.
Landholder (Dwelling #C4-6)	Multiple telephone calls, in person meetings and written correspondence	Potential visual and noise impact (specific to dwelling location) and potential impact to farming operations.
Landholder (Dwelling #C2-3 & C2-4)	Multiple telephone calls and written correspondence	Potential planning requirement impact to proximity to property boundary.
Landholder (Dwelling #8 & 9)	Multiple telephone calls and written correspondence	Potential planning requirement impact to proximity to property boundary – currently negotiating neighbour agreement.

Groups/Individuals	Dates	Issues discussed
Landholder (Dwelling #D7-4)	Multiple telephone calls, in person meetings and written correspondence	Discussions around visual impact (specific to dwelling location), potential to sell/purchase property, workforce accommodation.
Coolah township resident	Telephone calls + written correspondence supported by face-to-face meetings and preparation of photomontage. Discussions continued through October 2022.	Potential visual impact (specific to dwelling location).
Coolah township resident	Multiple telephone calls and written correspondence	Discussions around visual impact (overall), VPA and benefit sharing, and biodiversity and offsets.
Justin Brooker – CWO Aboriginal Working Group engagement (consultant)	Various dates (Nov 2022 – June 2023)	Discussions about First Nations engagement best practice in CWO REZ. Contracted to assist in the coordination of engagement with the CWO Aboriginal Working Group.
Maxine Greenfield – Transport for NSW – First Nations procurement	6 July 2023	Discussion on best practice approach to workforce planning for the region, local content and First Nations procurement.
Member of Parliament briefing – the Hon Mark Coulton MP	19 July 2023	LRWF project briefing to ensure the Member for Parkes is informed on the Project.
1800 Number	Ongoing – multiple calls (estimated ~40 calls between October 2022–March 2023)	Frequently raised topics include work on the project – assist callers with completing Goods & Services Register, general project information, cumulative impacts, sponsorship requests.

5.2.2 Government Agency Consultation

Details of consultation undertaken during development of the amendments is presented in **Table 5.2.**

Table 5.2 Consultation with government agencies during development of the amendments

Agency	Meeting date (post exhibition)	Issues discussed
Warrumbungle Shire Council (WSC)	14 and 15 December 2022 22 December 2022 3 April 2023 18 April 2023 3 May 2023 28 June 2023 27 July 2023	• Meeting to discuss council submission to Mod-1 application, including road upgrades and Voluntary Planning Agreement (VPA). • Public road upgrades site inspection with council officers, post-inspection discussion, and s138 approvals process. • Temporary Workforce Accommodation (TWA) potential sites and approvals pathway constraints.

Agency	Meeting date (post exhibition)	Issues discussed
Upper Hunter Shire Council (UHSC)	12 January 2023 27 July 2023	• Meeting to discuss council submission to Mod-1 application. • Public road upgrades site inspection with council officers. • Post-inspection discussion, and s138 approvals process. • Temporary Workforce Accommodation (TWA) potential sites and approvals constraints.
DPE	14 November 2022 30 March 2023 14 April 2023 27 June 2023 6 July 2023	• Regular updates on progress responses to submissions and design changes. • Efforts to avoid/minimise impacts to Box Gum Woodland CEEC. • Temporary Workforce Accommodation (TWA) potential sites and approvals constraints. • Potential quarry site and approvals constraints.
TfNSW	20 February 2023	• Meeting to discuss TfNSW submission to Mod-1 application. • Update on response to submissions. • OSOM route pinch points and approvals, including Denman Bridge. • Golden Hwy/Vinegaroy Road intersection design.
DPE – Biodiversity Conservation and Science Directorate (BCS)	Post-exhibition meeting: 16 November 2022 Site visit: 9 Feb 2023 with Umwelt 6 July 2023	• Meeting to discuss BCS submission to Mod-1 application. • Site visit to attend follow-up surveys. • BDAR assessment methodology, partial direct impact assessment methodology, and additional mitigation measures related to Box Gum Woodland CEEC.
NPWS	6 October 2022 11 January 2023 (turbine noise demonstration)	• Meeting to discuss NPWS submission to Mod-1 application. • Meeting to present noise and visual impact assessment findings. • Turbine noise demonstration within Coolah Tops National Park attended by Sonus and NPWS.
EnergyCo	Fortnightly bilateral CFG meetings	• Road upgrades, OSOM route. • Cumulative impacts (inc. traffic, waste, water). • Partial direct impact assessment approach. • Connection and access tender process.

5.3 Ongoing Consultation

Consultation with the community and key stakeholders is ongoing and will continue prior to and during construction of the Project. Ongoing consultation activities will aim to provide the community and stakeholders with awareness of construction processes and activities, updates on the proposed timing of construction and opportunities for ongoing feedback and input.

The Project website, email address and free call number will continue to be available prior to and during construction. Targeted consultation methods, such as newsletters, notifications, signage and face-to-face communications, will also continue to occur.

A more detailed approach to stakeholder and community engagement is outlined in the Stakeholder and Community Engagement Plan (SCEP) (refer to **Appendix 4**) that has been updated for the RTS Project. The SCEP is dynamic and is updated as required during the development, assessment, construction and operational phases. Engagement during operations will focus on maintaining regular communications with the community including reporting back to the community on compliance obligations, operations and generation updates, benefit sharing programs and promotion of community initiatives or events.

Environmental Management Plan(s) will address the procedures for receiving, evaluating and responding to complaints, environmental incidents and non-conformance during the construction and operation of the Project. Any complaints received will be handled in accordance with Tilt Renewables Complaints Handling Procedure (accessible here: https://www.tiltrenewables.com/contact/) and any Project-specific complaints handling procedure.

5.4 Benefit Sharing

Tilt Renewables is committed to sharing the benefits of its projects with the local communities that host them. There are several existing and proposed elements of the benefit sharing approach for the Liverpool Range Wind Farm project, these include the executed Voluntary Planning Agreement (VPA), CWO REZ Access Fees, the CWO REZ Access Tender Guidelines – Merit Criteria 6 and 7, and other Proponent-led initiatives. Further details on the benefit sharing approach for the Liverpool Range Wind Farm project are provided in the Stakeholder and Community Engagement Plan (SCEP) that has been updated for the RTS Project.

Based on community consultation and feedback, Tilt Renewables has proposed to significantly increase the funding commitment for benefit sharing programs during construction and operation of the Project, and have committed to the following:

- $1.2 M per year during the construction period (including VPA commitments).
- $1.2 M for the first 5 years of operations (including VPA commitments).
- $800,000 per year (VPA) over the remaining operational lifetime of the Project.

Under the CWO REZ Access Scheme, annual access fees are payable for a range of purposes.
The community, employment, and REZ contribution is expected to be a fixed per unit fee of approximately $4,000–$5,000 / MW / year. Tilt Renewables is working with EnergyCo to ensure the prescribed access fees for the CWO REZ are invested in a manner that is tailored to key priorities in the local communities in and around the Project site.

Other benefit sharing activities will include neighbour benefit programs, local employment opportunities and training initiatives, as well as commitments as part of fulfilling Merit Criteria 6 and 7 targets.

A tailored Benefit Sharing Plan (BSP) will be prepared for the Project before it commences construction. The BSP will endeavour to capture the needs of the community by seeking their input in its development.

Tilt Renewables has commenced investment into the local communities of Coolah and Cassilis. Community groups and organisations located in the region of the Project have been encouraged to apply for funding or in-kind support through the fund. Funds have been provided to support a range of community-initiated projects, events and activities that respond to the local communities' needs and aspirations, and contribute to long-term and sustainable outcomes for the region surrounding the Project. In accordance with this approach, as of July 2023, Tilt Renewables has provided over $60,000 and nearly 30 grants over the past four years.

Examples of community investment initiatives that Tilt Renewables has supported over the last 12 months are provided in **Table 5.3.**

Table 5.3 Examples of local investments made to-date

Groups/Individuals	Dates	Details
Coolah Men's Shed opening (annual sponsorship)	18 November 2022	Attendance to uncover new signage of the Men's Shed, including Tilt Renewables logo on Men's Shed ute.
Merriwa Country Education Foundation (scholarship contribution)	November 2022	Contribution towards students' tertiary education costs and discussion with Coolah District Development Group to assist them in setting up a Coolah CEF branch.
Coolah Veterans Touch Football Carnival (sponsorship)	5–6 November 2022	Tilt Renewables had a marquee at the carnival to ensure visibility in the community and speak to community members on the days about the Project.
Tunes on the Turf (sponsorship)	12 November 2022	As above, both events received neutral to positive discourse.
Coolah Swimming Club (sponsorship)	December 2022	Contribution of funds towards swimming carnival.
Coolah Senior Citizens dinner (sponsorship)	8 February 2023	Sponsorship of annual event – over 100 attendees. Tilt also provided merchandise for attendees.
Dunedoo Show	10–11 February 2023	Sponsorship of the event and Tilt Renewables had a marquee with Project information material and spoke to community members about the project.
Coolah Men's Shed	21 May 2023	Sponsored BBQ to raise money for the newly established Coolah Country Education Foundation. Participated in games and took the opportunity to discuss the Project.

6.0 Assessment of Impacts

This section provides a summary of the additional assessments undertaken to assess the potential construction and operational impacts associated with the amendments proposed to the Approved Project by the updated RTS Project. Where required, additional or revised mitigation measures have been proposed. A consolidated summary of all proposed commitments identified in the Mod-1 Assessment Report and any changes made through this Amendment Report, is presented in **Appendix 5**.

Section 7.0 of the Mod-1 Assessment Report provided an assessment of the key environmental impacts of the modifications proposed to the Approved Project by the Mod-1 Project. the Project. This Amendment Report and its appendices assess the environmental impacts associated with the amendments and has been prepared in consideration of the *State Significant Infrastructure Guidelines – Preparing an Amendment Report* (DPE, 2021).

Consideration of the potential environmental impacts was undertaken as part of the development of the RTS Project with potential changes compared to the environmental impacts of the Approved Project. A summary of environmental aspects and their potential to be affected by the RTS Project is provided in **Table 6.1**. Technical reports from additional studies undertaken are provided in **Appendix 4 to Appendix 11**.

Table 6.1 Assessment approach

Environmental aspect	Assessment approach	Reference
Visual Impact	Additional assessment has been undertaken to determine potential impacts related to the amended turbine and ancillary infrastructure layout as well as changes to turbine numbers and height. Impacts have been assessed via a revised Visual Impact Assessment (VIA) (Moir 2023).	**Section 6.1** and **Appendix 6**
Shadow Flicker	Additional assessment has been undertaken to consider the revised turbine layout consisting of 185 turbines and maximum blade tip height of 215 m above ground level (AGL). Impacts have been assessed via a revised Shadow Flicker Assessment (WSP 2023).	**Section 6.2** and **Appendix 7**
Noise	Additional assessment has been undertaken to consider the changes to turbine numbers and location, as well as ancillary infrastructure and site access point changes. Impacts have been assessed via a revised Predictive Noise Impact Assessment (PNIA) (Sonus 2022).	**Section** and **Appendix 8**
Biodiversity	Additional biodiversity surveys have been undertaken for the RTS Project. Impacts have been assessed via a revised Biodiversity Development Assessment Report (BDAR) (Umwelt 2023).	**Section 6.4** and **Appendix 9**
Aboriginal Heritage	Additional Aboriginal cultural heritage surveys have been undertaken for the RTS Project. Impacts have been assessed via an addendum to the Aboriginal Cultural Heritage Assessment (ACHA) (Umwelt 2023).	**Section 6.5** and **Appendix 10**

Environmental aspect	Assessment approach	Reference
Historic Heritage	A site walkover of additional areas not previously surveyed or assessed by the Original EIS and Mod-1 Assessment Report was undertaken as part of the additional Aboriginal heritage assessment for the RTS Project. During the site walkover no potential historic heritage items were observed. There is no change to the previous historic heritage assessment and management recommendations undertaken as part of the Mod-1 Assessment Report.	-
Traffic and Transport	Additional assessment has been undertaken to determine the potential traffic and transport impacts associated with the proposed changes to the Approved Project as well as identifying the required road upgrade and repair treatments. The assessment is set out in the Supplementary Traffic Impact Assessment and Response to Road Authority Submissions (Constructive Solutions 2023)	**Section 6.6** and **Appendix 11**
Electromagnetic Interference (EMI)	Additional assessment was undertaken as part of the revised Electromagnetic Interference Assessment (EMIA) (WSP 2023). The additional assessment for the RTS Project considered the removal of 35 wind turbines, the revised wind turbine layout, and a decrease to the indicative wind turbine envelope.	**Section 6.7** and **Appendix 12**
Aviation	To determine potential impacts from the revised turbine numbers, height and layout, additional aviation assessment work was undertaken. Impacts were assessed via a revised Aviation Impact Assessment (AIA) (Aviation Projects 2023).	**Section 6.8** and **Appendix 13**
Social and Economic Impacts	A Social Impacts and Management Overview (SIMO) Report (Umwelt 2023) was prepared to identify social impacts and opportunities as well as available management and mitigation measures for the RTS Project. An Accommodation and Employment Framework identifying options and considerations for the construction workforce has also been prepared.	**Section 6.9** and **Appendix 14**

6.1 Visual Impact

The VIA (Moir 2022) prepared for the Mod-1 Assessment Report has been revised and updated to assess the amendments to the Project. The revised VIA (Moir 2023) is provided in **Appendix 6**.

6.1.1 Impact Assessment

The VIA was undertaken to assess the potential changes in visual impact associated with the RTS Project compared to the Approved Project in accordance with all relevant guidelines within the *Wind Energy: Visual Assessment Bulletin for State Significant Wind Energy Development* (DPE 2016) ('Visual Assessment Bulletin').

Preliminary Assessment Tools (based on a 2D assessment alone) were applied as per the Visual Assessment Bulletin to identify those dwellings and key public viewpoints that require more careful consideration and detailed assessment. The Preliminary Assessment Tools include assessment of two key parameters: visual magnitude and the multiple turbine tool.

6.1.1.1 Visual Magnitude

Due to the proposed increase in maximum blade tip height from the Approved Project (165 m AGL) to the RTS Project (215 m AGL), the visual magnitude threshold increases from 2,200 m to 2,850 m (black line of visual magnitude) and from 3,300 m to 4,250 m (blue line of visual magnitude). The increase in visual magnitude threshold means:

- an increase of one non-associated dwellings located within the 'black line' (from 3 to 4)
- an increase of 21 non-associated dwellings located within the 'blue line' (from 9 to 30).

The VIA included a comparative assessment from all 59 non-associated dwellings within 5,000 m of the nearest wind turbine (see Comparative Dwelling Assessment below).

6.1.1.2 Multiple Turbine Tool

The application of the Multiple Turbine Tool to the RTS Project identifies that three non-associated dwellings have turbines in a decreased number of 60 degree sectors as follows:

- Two non-associated dwellings (dwellings H7-1 and H7-2) have turbines in a decreased number of 60 degree sectors (from three 60 degree sectors to two 60 degree sectors).
- One non-associated dwelling (dwelling G6-2) has a decrease from four 60 degree sectors to three 60 degree sectors with turbines.

According to the revised VIA, no non-associated dwellings will experience an increase in the number of 60 degree sections in which turbines will be visible when compared to the Approved Project.

This assessment was based on a 2D assessment and further detailed assessment of these dwellings identified topography and vegetation would likely reduce the number of sectors with turbines visible.

6.1.1.3 Zone of Visual Influence

Zone of Visual Influence (ZVI) modelling was utilised to show the theoretical visibility of the Approved Project and RTS Project, based on topography alone. The ZVI is a preliminary tool used to provide an early indication of any major increase or reduction in the extent of visibility of the project. Two sets of comparative ZVI figures (from blade tip and hub height) were prepared to provide a comparison of the theoretical visibility of the Approved Project and RTS Project turbine layouts (refer to Figures 9 to 12 in **Appendix 6**).

The comparative ZVI figures illustrate that the potential extent of visibility of the RTS Project is generally consistent with the Approved Project. The comparative ZVI diagrams (Figure 9 and Figure 10 of **Appendix 6**) indicate some areas where turbine visibility at blade tip height potentially increases as a result of the RTS Project compared to the Approved Project, however the potential increase in turbine visibility generally occurs in areas where there are no existing dwellings.

A comparison of ZVI diagrams prepared based on the hub height of the Approved Project (Figure 11 **Appendix 6**) and RTS Project (Figure 12 **Appendix 6**) indicates the visibility of the RTS Project at hub height is largely consistent with the visibility of the Approved Project at hub height. Areas of land that show a slight increase to the number of visible turbines at hub height are generally uninhabited or within the Project Site where only associated dwellings are located.

The high level assessment provided by the ZVI comparisons confirms that the number of visible turbines associated with the RTS Project has been reduced when compared with the Approved Project due to the proposed reduction in the maximum number of turbines.

6.1.1.4 Comparative Dwelling Assessment

A comparative dwelling assessment was undertaken to demonstrate the extent of change in potential visual impact between the Approved Project and RTS Project from representative dwellings.
The comparative assessment considered the number of turbines visible at both hub height and blade tip height at all non-associated dwellings located within 4,250 m (blue line) of a RTS Project turbine. It was found that the increase in the maximum blade tip height and the reduction in the number of turbines has resulted in alterations to the number of visible turbines from the majority of the non-associated dwellings assessed. As a result of the RTS Project:

- Ten non-associated dwellings are likely to have an increased number of turbines visible.
- Twenty-three non-associated dwellings are likely to have a reduction in the number of visible turbines.
- One non-associated dwelling is likely to have no variation to the number of visible turbines.
- The distance to the nearest turbine has been increased for 13 non-associated dwellings and reduced for 21 non-associated dwellings.

A comparison of visual impact ratings for dwellings from the Approved Project to RTS Project concluded that the RTS Project would not result in an increased level of visual impact from any of the assessed dwellings.

6.1.1.5 Detailed Dwelling Assessment ('black line assessment')

In addition to the comparative dwelling assessment, which was based on a desktop assessment, site inspections were undertaken at the four non-associated dwellings within the black line of visual magnitude for the RTS Project (2,850 m of the nearest turbine). The site inspections informed a detailed assessment of the RTS Project utilising a methodology specifically formulated by the *Guidelines for Landscape and Visual Impact Assessment (GLVIA3), Residential Visual Amenity Assessment (RVAA)* for the assessment of impacts on residential visual amenity.

Of the four non-associated dwellings within the black line of visual magnitude, access was granted to two. For the other two dwellings, the site inspection occurred from public viewpoints. Photomontages illustrate that existing intervening elements (including sheds and vegetation) would reduce the visibility of the RTS Project. The visual impact rating was reduced for three of the four non-associated dwellings within the black line of visual magnitude.

6.1.1.6 Associated Infrastructure

In addition to the changes to turbine parameters and layout, the RTS Project also includes some minor alterations to the layout of associated infrastructure, such as transmission line alignments, collector substations, access tracks, Operations and Maintenance (O&M) facility, construction compound and laydown areas. The detailed assessment of changes to the associated infrastructure is provide in Section 12 of **Appendix 6**.

The key findings are summarised as follows:

- the internal overhead reticulation 33 kV power lines have been removed
- the External Transmission Line has remained generally consistent with the Approved Project
- the visual impacts associated with associated infrastructure are generally consistent with the findings in the original VIA for the Approved Project.

6.1.1.7 Summary

Overall, the number of turbines proposed in the RTS Project has been reduced and there are minimal changes to the development footprint. Although the vertical scale of the turbine proposed by the RTS Project has increased, the VIA concludes that the magnitude of change to the surrounding visual landscape resulting from the RTS Project is largely consistent with the level of change that was deemed acceptable for the Approved Project.

6.1.2 Management and Mitigation Measures

Mitigation measures have been recommended to assist in reducing potential impacts associated with the revised layout and design of turbines and associated infrastructure proposed by the RTS Project. As a result of the detailed dwelling assessment, it is recommended that screen planting or supplementary planting is made available to 10 non-associated dwellings between the blue and black line (2,850 – 4,250 m). This is an increase of 250 m to the distance specified in the Development Consent to reflect the increase in visual magnitude in accordance with the Visual Assessment Bulletin.

6.2 Shadow Flicker

The Shadow Flicker Assessment (WSP 2022) prepared for the Mod-1 Assessment Report has been revised and updated to assess the amendments to the Project. The revised Shadow Flicker Assessment (WSP 2023) is provided in **Appendix 7**.

6.2.1 Impact Assessment

The shadow flicker assessment was undertaken in accordance with the key assumptions and methodology in the *Draft National Wind Farm Guidelines* (Environment Protection and Heritage Council July 2010). The assessment considered the revised turbine layout consisting of 185 turbines with a maximum blade tip height of 215 m above ground level (AGL). As per the guidelines, the impact of shadow flicker was assessed to a distance of 265 times maximum blade chord width (4.32 m), equating to a shadow flicker assessment distance of 1,145 m from each proposed turbine.

The assessment considered shadow flicker impacts for both theoretical worst-case scenario (which excludes a reduction in impacts due to cloud cover, turbine operation and orientation) and realistic case scenario (which includes a reduction in potential impacts due to cloud cover, turbine operation and orientation) on each dwelling. The assessment inputs included a total of 224 dwelling locations within and surrounding the Project area consisting of associated and non-associated dwellings. The full list of assessment parameters for each scenario is provided in Section 3.2 of **Appendix 7**.

Shadow flicker was calculated at dwellings for a height of 2 m (representing ground floor windows) and 6 m (representing first floor windows). Neither the theoretical worst-case scenario or realistic case scenario model considered intervening vegetation or structures in the landscape (e.g. outbuildings, dwelling configuration etc) that may reduce or remove shadow flicker impacts on dwellings. This results in additional conservatism built into the shadow flicker model. Further, wind speed data available from the reference data was not considered suitable to estimate operational hours of turbines, and therefore it was assumed that turbines were always operating under both the theoretical and realistic case scenario assessments. This is expected to result in additional minor conservatism to the realistic case scenario shadow flicker model.

It should be noted that WSP previously undertook the shadow flicker assessment of the Approved Project utilising the same model and assumptions as the current assessment for the RTS Project. The consistent methodology allows for direct comparison of impacts between the Approved and RTS Projects.

The results of the assessment for the RTS Project indicate that no shadow flicker would be experienced within 50 m of any existing dwellings, at 2 m or 6 m AGL for either the theoretical worst-case or realistic scenarios. Condition 4 (Schedule 3) of the Development Consent (SSD 6696) states that: *The Applicant must ensure that shadow flicker associated with wind turbines does not exceed 30 hours per year at any non-associated residence*. This condition would be satisfied by the RTS Project.

In terms of the Approved Project (267 turbines), the previous assessment indicated that no shadow flicker would be experienced at any existing dwellings. Therefore, the RTS Project would not result in any increase in shadow flicker above the Approved Project.

Blade glint can be produced via the reflection of the sun's light from the surface of a turbine blade. Modern turbine blades are generally coated with non-reflective paint, to prevent the occurrence of blade glint. Non-reflective paint will be a requirement for the turbine blades for the Project.

6.2.2 Management and Mitigation Measures

No additional management and mitigation measures are proposed for the RTS Project.

6.3 Noise

The PNIA (Sonus 2022) prepared for the Mod-1 Assessment Report has been revised and updated to assess the RTS Project turbine and infrastructure layout. The revised PNIA (Sonus 2023) is provided in **Appendix 8**.

6.3.1 Impact Assessment

The key amendments to the Project compared to the Approved Project that may influence the noise assessment are as follows:

- A reduction in the number of wind turbines to 185.
- Increased hub height of 129 m above ground level (AGL) and increased tip height to 215 m.
- Revised locations for the on-site collector substations.
- Revised potential concrete batching locations.
- Changes in the access points into and out of the wind farm site.

The PNIA has been prepared in accordance with applicable guidelines (refer to **Appendix 8**) and reference to the relevant Conditions of Approval for the Project.

6.3.1.1 Operational Turbine Noise

Condition 10 of Schedule 3 of the Development Consent requires that noise levels associated with the operation of the turbines must achieve the noise level criteria set out in Table 4 of the Conditions of Consent at all non-associated residences. The criteria were determined through the Original EIS assessment and associated background noise monitoring undertaken in 2012.

The RTS Project proposes changes to the turbine locations and hub height. Contemporary background noise monitoring has been undertaken which enables extrapolation to the increased hub height to update the noise level criteria for non-associated residences. The revised noise level criteria for non-associated residences are presented in Section 3 of **Appendix 8**. At associated residences with an agreement with Tilt Renewables, the noise level criteria are as specified in that agreement.

The noise level from turbine operation at all residence locations in the vicinity of the Project was predicted for each hub height integer wind speed. The predictions provided are the noise level from operation of the 185 wind turbines operating concurrently at the integer wind speeds. The assessment identified that no penalty for low frequency noise or tonal characteristics was required. The results of the predictions at associated and non-associated residences are presented in Section 3 of **Appendix 8.** The noise predictions show that the noise criteria are met for all non-associated residences with the highest predicted noise level being 35 dB(A). While there are no objective requirements under the Bulletin for the noise level at associated residences, the highest predicted noise level for an associated residence was 42 dB(A).

6.3.1.2 Comparative Analysis

A comparison was undertaken between the predicted operational turbine noise levels for the RTS Project with the Original EIS/RTS assessment predicted noise levels for the Approved Project for both associated and non-associated residences. When comparing the results it should be noted that a 1 dB(A) change in noise level is not perceptible and a 3 dB(A) change would be described as “just noticeable”. The results identify that predicted noise levels at numerous residences would reduce as a result of the proposed amendments, generally by 1–2 dB(A) with a few residences up to 4–5 dB(A). The majority of residences are predicted to have a small increase in predicted noise varying from 0.1–2 dB(A), and the greatest increase is estimated to be 3 dB(A).

6.3.1.3 Ancillary Infrastructure Noise

The RTS Project proposes up to seven collector substations at revised locations within the wind farm site, as well as a single connection switching station at the termination of the external transmission line at Ulan. There are no significant noise sources at a connection switching station and therefore no assessment was undertaken for the Ulan location.

Noise levels from ancillary infrastructure were predicted and compared to the criterion of 35 dB(A) at non-associated residences as specified in Condition 11 of Schedule 3 of the Development Consent. The NSW Noise Policy for Industry (EPA, 2017) (the NPI) states that a correction factor should be applied if the assessed noise has a character that has the potential to be annoying, such as tonality, modulation or dominant low-frequency content. As transformers at a substation have the potential to exhibit tonality, a 5 dB(A) correction factor was applied at all locations and for all periods, which effectively reduces the criterion to 30 dB(A) at non-associated residences. The assessment also assumed that all seven collector substations were operating concurrently with worst case weather conditions, representing a conservative assessment approach.

The noise criterion of 30 dB(A) was predicted to easily be achieved at all non-associated residences from full load operation at the seven substation locations. The highest predicted noise level for both non-associated and associated residences was less than 20 dB(A).

6.3.1.4 Construction Noise

Noise levels were predicted at residences in the vicinity of the 14 potential concrete batching plant locations. For the purposes of the predictions, it was assumed that all 14 potential locations were operating concurrently, although in reality only up to nine locations within the wind farm site and one location along the external transmission line will actually be utilised non-concurrently, and therefore this represents a conservative approach. As required under the Interim Construction Noise Guideline (DECC, 2009) (the ICN Guideline), the predictions included a 5 dB(A) penalty for the noise character of the construction activities.

Based on the conservative batch plant operation predictions, one non-associated residence has a predicted noise level of greater than 45 dB(A) and would be considered "Noise Affected" under the ICN Guideline during recommended standard hours. For work that may occur *outside recommended standard hours* there would be six non-associated residences with a predicted noise level of greater than 35 dB(A) and considered "Noise Affected". This relates to the operation of a potential batch plant near Cliffdale Road, Turill along the external transmission line only.

Where residences are noise affected, justification must be provided for the works to proceed, and all "feasible and reasonable" noise control strategies must be implemented to minimise noise. The assessment outcome is consistent with the existing Conditions of Consent and the ICN Guidelines which will continue to govern these construction activities.

It is noted that there are no noise criteria for construction activities at associated residences and therefore higher noise levels are deemed acceptable. Based on the conservative batch plant operation predictions, six associated residences have predicted noise levels greater than 45 dB(A).

A comparison of the RTS Project turbine layout and Approved Project turbine layout was made considering the distance from turbines to the nearest residence. It was determined that the distance between turbines and residences has not decreased, therefore it is expected that there would be no greater impact from construction activity at non-associated residence locations for the RTS Project.

6.3.1.5 Construction Traffic Noise

The Original EIS/RTS noise assessment established the construction traffic noise criterion of 55 dB(A) in accordance with the NSW Road Noise Policy (DECCW, 2011) (the RNP). The Original EIS/RTS noise assessment determined that the criterion would be achieved for approximately 300 vehicle movements per day at a distance of 50 m from the road side.

The RTS Project revised construction access route does not introduce any additional non-associated residences closer than 50 m to the route. The RTS Project peak construction vehicle movements is 337 per day. Based on a 6-day working week, the proposed number of vehicles per day to the site would result in a similar number to that which has been addressed by the Original EIS/RTS noise assessment. Therefore, it is expected that no greater impact from traffic will result at the non-associated residences from the RTS Project.

Condition 5 of Schedule 3 of the Conditions of Consent require that the wind farm developer provide mitigation measures to four specific residences in the vicinity of the wind farm upon request to mitigate construction vehicle noise. The Conditions of Consent are consistent with the RNP and would continue to govern such activity. Therefore, no additional assessment has been made in the PNIA with respect to the noise from traffic activities.

6.3.1.6 Blasting

The separation distance between a turbine and the closest non-associated residence would not be reduced as a result of the RTS Project. Therefore, it is expected that there would be no greater impact from blasting activity at a non-associated residence when compared to the Approved Project. Blasting is addressed by timing controls and limits in the Development Consent and the RTS Project will continue to comply with these conditions.

6.3.1.7 Coolah Tops National Park

Tilt Renewables has removed five turbines that were proposed by the Mod-1 Project in the north east portion of the Project site near Coolah Tops National Park. Noise level contours show that at locations within Coolah Tops National Park such as lookouts, camp grounds and historic locations, noise levels of less than 35 dB(A) are predicted. This is consistent with the noise level assigned to protect residential living amenity during the night and is less than the noise level which may be expected from other naturally occurring sources such as wind in trees, birds and insects at the same locations.

6.3.2 Management and Mitigation Measures

No additional management and mitigation measures are proposed for the RTS Project.

6.4 Biodiversity

The Biodiversity Development Assessment Report (BDAR) (Umwelt 2022) prepared for the Mod-1 Assessment Report has been revised and updated to assess the RTS Project. The revised BDAR (Umwelt 2023) is provided in **Appendix 9**.

6.4.1 Impact Assessment

The Approved Project was assessed under the *NSW Biodiversity Offsets Policy for Major Projects 2014* (NSW Offsets Policy) using the Framework for Biodiversity Assessment (FBA). Consent Condition 19(b) (SSD 6696) requires calculation of the biodiversity offset credit liabilities prior to construction in accordance with the FBA.

In 2016, the NSW *Threatened Species Conservation Act 1995* (TSC Act) was repealed and replaced with the *Biodiversity Conservation Act 2016* (BC Act), which commenced on 25 August 2017. The inception of the BC Act changed the assessment requirements for SSD projects in NSW with biodiversity impact assessment needing to meet the requirements of the Biodiversity Offset Scheme (BOS) via application of the Biodiversity Assessment Method (BAM). Consultation with BCS and DPE has confirmed that the BAM is the applicable assessment methodology for the RTS Project.

6.4.1.1 Improved Vegetation Mapping – Outcomes for Impact Assessment

Consent Condition 19(a) (SSD 6696) states that prior to construction commencement the baseline vegetation and key habitat mapping must be updated for the final disturbance area. To address this requirement, substantial additional vegetation survey and threatened ecological community (TEC) analysis has been undertaken as part of the BDAR that was prepared for the Mod-1 Project in 2022 and this updated BDAR prepared for the RTS Project. The more comprehensive survey and analysis undertaken for the RTS Project has resulted in a more detailed map of Plant Community Types (PCTs), vegetation zones and TECs across the Project site.

The additional assessment and revised mapping identified a greater extent of NSW Box Gum Woodland critically endangered ecological community (CEEC) in the Approved Development Corridor compared to the area of this community previously identified as part of the Original EIS biodiversity assessment (NGH Environmental 2013a, 2013b and 2017). The current assessment has identified the Approved Development Corridor to contain 3,081.19 ha of NSW Box Gum Woodland CEEC compared to 1,871.87 ha identified in the Original EIS assessment. This is an additional 1,209.32 ha of NSW Box Gum Woodland CEEC above that identified in the Approved Project documentation.

6.4.1.2 Comparison of Approved Project and RTS Project

The RTS Development Corridor is a buffer area that occupies approximately 8,717 ha, within which all proposed infrastructure must be located and allows for micrositing of infrastructure to occur. The total combined RTS Project Indicative Development Footprint (incorporating wind farm, external transmission line and public road upgrades) represents the indicative ground disturbance and vegetation removal (native and exotic) associated with all relevant infrastructure. The RTS Project Indicative Development Footprint is approximately 1,794.1 ha compared to 752.82 ha that was estimated for the Approved Project. It should be noted that the Approved Project did not include an estimate for disturbance related to public road upgrades which has been calculated as 184.7 ha for the RTS Project. A comparison of the Development Corridor and Development Footprint for the Approved Project, Mod-1 Project and RTS Project is provided in **Table 6.2**.

Table 6.2 Comparison of development corridor and indicative development footprint for Approved Project, Mod-1 Project and RTS Project

Project Boundaries	Approved Project (SSD 6696) (2018)	Mod-1 Project (2022)	RTS Project (2023)	Difference between RTS Project and Approved Project
Development Corridor	12,405.04 ha	12,601.7 ha	8,717 ha	**-3,688.04 ha**
Development Footprint	752.82 ha	1,790.1 ha	1,794.1	**+1,041.28 ha**

The RTS Project Indicative Development Footprint is a more realistic estimate of the likely ground disturbance and vegetation/habitat removal required to construct the Project compared to the Approved Project. This is a result of the significant design work, geotechnical investigations, and constructability assessments that have been completed, inclusion of impacts associated public road upgrades/repairs, as well as the improved vegetation mapping described above. In developing the RTS Project Indicative Development Footprint, Tilt Renewables has been able to apply the lessons learned and outcomes from the design and construction of their Rye Park Wind Farm to ensure a realistic approach was undertaken.

Impacts to threatened species (species-credit species and ecosystem-credit species) were not assessed in detail for the Approved Project (Determination Assessment Report (DPIE 2018b)). Instead, these species were assessed using a uniform area of habitat. As the RTS Project has assessed impacts to species-credit species in accordance with BAM, species polygons have increased in size due to the rigour of the assessment undertaken for the RTS Project and the BAM.

Due to factors summarised above, the ability to directly compare the impacts identified in the Approved Project (SSD 6696) with those of the RTS Project is limited.

A summary of the change in direct impacts to biodiversity values associated with the RTS Project compared with the Approved Project is presented in **Table 6.3**.

Table 6.3 Summary of Change Between Approved Project and RTS Project

PCT/Species	Approved Project Area of Impact (ha)[1]	RTS Project - Area of Impact (ha)	Change between Original Approval and RTS Project
Ecosystem			
PCT 84 – River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	6.47	9.5	**+3.0**
PCT 281 – Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	18.94	13.4	**-5.5**
PCT 395 – Derived speargrass - wallaby grass - wire grass mixed forb grassland mainly in the Coonabarabran - Pilliga - Coolah region	77.26	-	**-**

PCT/Species	Approved Project Area of Impact (ha)[1]	RTS Project - Area of Impact (ha)	Change between Original Approval and RTS Project
PCT 467 – Blue-leaved Ironbark - Black Cypress Pine shrubby sandstone open forest in the southern Brigalow Belt South Bioregion (including Goonoo)	3.30	-	**-3.3**
PCT 477 – Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion	31.51	-	**-31.5**
PCT 479 – Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion	42.65	19.8	**-22.9**
PCT 480 – Black Cypress Pine - ironbark +/- Narrow-leaved Wattle low open forest mainly on Narrabeen Sandstone in the Upper Hunter region of the Sydney Basin Bioregion	10.32	-	**-**
PCT 481 – Rough-barked Apple - Blakely's Red Gum - Narrow-leaved Stringybark +/- Grey Gum sandstone riparian grass fern open forest on in the southern Brigalow Belt South Bioregion and Upper Hunter region	30.04	12.7	**-17.3**
PCT 483 – Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley	101.10	806.1	**+705.0**
PCT 488 – Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion	70.16	638.7	**+568.5**
PCT 490 – Silvertop Stringybark - Forest Ribbon Gum very tall moist open forest on basalt plateau on the Liverpool Range, Brigalow Belt South Bioregion	3.12	15.2	**+12.1**
PCT 495 – Brittle Gum - Silvertop Stringybark grassy open forest of the Liverpool Range, Brigalow Belt South Bioregion	1.51	23.7	**+22.2**
PCT 278 – Blakely's Red Gum – Grey Box – White Box – Riparian Woodland	3.55	-	**-3.6**
PCT 478 – Sandstone Forest – Red Ironbark dominant	1.20	-	**-1.2**

PCT/Species	Approved Project Area of Impact (ha)[1]	RTS Project - Area of Impact (ha)	Change between Original Approval and RTS Project
PCT 588 – White Box – Cypress Pine Shrubby Open Forest	0.36	-	**-0.4**
PCT 1661 - Narrow-leaved Ironbark - Black Pine - Sifton Bush heathy open forest on sandstone ranges of the upper Hunter and Sydney Basin	n/a	57.8	-
PCT 1675 - Scribbly Gum - Narrow-leaved Ironbark - Bossiaea rhombifolia heathy open forest on sandstone ranges of the Sydney Basin	n/a	31.9	**3.0**
Subtotal (ha)	**401.49**	**1,628.8**	**+1,225.2**
Species			
Ausfeld's wattle	-	10.5	**10.5**
silky swainson-pea	1.0	17.5	**16.5**
glossy black-cockatoo	19.0	2	**-17.0**
large-eared pied bat	19.0	106.7	**87.7**
square-tailed kite	-	1.5	**1.5**
squirrel glider	19.0	116.1	**97.1**
eastern cave bat	19.0	108.4	**89.4**
southern greater glider	-	19.3	**19.3**
black-chinned honeyeater[2]	19.0	-	-
powerful owl[3]	19.0	-	-
corben's long-eared bat[2]	19.0	-	-
grey-crowned babbler[2]	19.0	-	-
diamond firetail[2]	19.0	-	-
masked owl[3]	19.0	-	-
eastern bentwing bat	19.0	-	-

[1] Determination Assessment Report (DPIE 2018b); [2] This species is an Ecosystem Credit Species under BAM (DPIE 2020a) and as such does not require an individual assessment of habitat; [3] This species is a Dual Credit Species (Ecosystem and Species) (DPIE 2020a), however only breeding habitat is recognised as the species credit component and no breeding habitat for the species were recorded.

6.4.1.3 Impacts to Native Vegetation and Habitat

The RTS Indicative Development Footprint impacts 10 PCTs across 17 condition classes and seven species credit species, as listed in **Table 6.3**, with a total area of 1794.1 ha.

6.4.1.4 Impacts to NSW Box Gum Woodland CEEC

The RTS Project will impact a total of 428.3 ha of NSW Box Gum Woodland CEEC across three component areas:

- 321.7 ha (75%) within the wind farm footprint
- 95.7 ha (22%) within the external transmission line footprint
- 10.9 ha (3%) within the public road upgrade footprint.

Impacts to the NSW Box Gum Woodland CEEC are 227.5 ha greater than the impact threshold of 200.85 ha for this TEC as specified in Condition 18(a) of the Development Consent SSD 6696. Approximately 396.7 ha (92.6%) of the NSW Box Gum Woodland CEEC to be impacted within the RTS Indicative Development Footprint is considered to be in either derived native grassland or low condition. The remaining 31.6 ha (7.4%) to be impacted is considered to be in moderate to good condition.

In total, 2,644.7 ha of NSW Box Gum Woodland CEEC was identified within the RTS Development Corridor which indicates the extent of this vegetation across the landscape. Despite the removal of 428.3 ha of the NSW Box Gum Woodland CEEC by the RTS Project, approximately 2,216.4 ha (or nearly 84%) will remain in the RTS Development Corridor.

6.4.1.5 Impact Avoidance and Minimisation

The Project has undergone substantial design changes since Tilt Renewables took ownership of the Project in 2019. Design changes have been made with a focus on avoiding impacts to native vegetation and habitat where possible and in particular to NSW Box Gum Woodland CEEC. Avoidance measures included targeted reduction of impacts to higher quality patches of the NSW Box Gum Woodland CEEC, through removal/relocation of wind turbines.

To minimise ground disturbance, Tilt Renewables has applied several design strategies, including prioritising the use of spur lines along the ridges to locate access tracks from the nearby public roads to the ridgelines where turbines are located. Through the introduction of static synchronous compensators (STATCOMs) that allow larger underground reticulation cabling to be used the need for additional underground reticulation cabling adjacent to access tracks can be minimised. Ground disturbance can be further minimised through steepening the cut/fill batter design in specific locations where geotechnical conditions allow. Given the broad extent of the NSW Box Gum Woodland CEEC within the RTS Development Corridor, it is impossible to completely avoid impacts to the NSW Box Gum Woodland CEEC, and very difficult to further minimise impacts by re-routing access tracks from public roads to the turbines without requiring circuitous and excessively long access track alignments which would result in increased ground disturbance impacts and impacts to other constraints including landholder no-go-zones, existing land uses, and better quality patches of NSW Box Gum Woodland CEEC. Ultimately, such alternative options are not likely to be supported by landholders, and therefore are not feasible for the RTS Project.

6.4.1.6 Potential Impacts to Birds and Bats

The BAM assessment considered potential impacts associated with turbine strike and barotrauma (tissue damage caused by rapid pressure changes) on protected bird and bat species. The assessment considered 22 species (16 birds and six bat species) based on them being recorded within the RTS Project site, and the known susceptibility of the species to turbine strike and barotrauma. The results of the risk assessment determined that four species were considered to be at High risk, 15 species were considered to be at Moderate risk and three species were considered at Minor risk of being impacted by turbine strike and barotrauma. The species identified as having a High risk were:

- white-throated needletail
- large bent-winged bat
- regent honeyeater
- swift parrot.

The removal of 10 wind turbines for the RTS Project, compared with the Mod-1 Project, has reduced the potential frequency of interaction with turbines for the barking owl, powerful owl and masked owl. This was the primary consideration for the risk rating for these species reducing from High to Moderate for the RTS Project compared to the Mod-1 Project.

When considering the 'Collision Risk Analysis' undertaken for the Approved Project (NGH Environmental 2017) and the current BDAR for the RTS Project, it is important to note that the dataset and risk assessment methodology used differs between the two, thus making a direct comparison in change to biodiversity impacts difficult.

The results of the BDAR assessment will inform the Bird and Bat Adaptive Management Plan (BBAMP) which will be prepared in consultation with BCS and in accordance with the Development Consent. The BBAMP will detail the mitigation measures aimed at reducing the collision risk for the identified species.

6.4.1.7 Matters of National Environmental Significance under the EPBC Act

The RTS Project will impact six Matters of National Environmental Significance (MNES), being Commonwealth Box Gum Woodland CEEC and potential foraging habitat for the regent honeyeater, swift parrot, large-eared pied-bat and koala. Three of the six MNES impacts are consistent with the Approved Project (EPBC 2014/7136), being Commonwealth Box Gum Woodland CEEC, regent honeyeater and swift parrot. The Approved Project also undertook Assessments of Significance for the koala and large-eared pied-bat. The southern greater glider was not listed at the time of granting EPBC 2014/7136. Impacts of the RTS Project include the removal of vegetation/habitat as follows:

- 31.6 ha of Commonwealth Box Gum Woodland CEEC
- 603.8 ha of potentially suitable habitat for the regent honeyeater (threatened species)
- 302.5 ha of potentially suitable habitat for the swift parrot (threatened species)
- 106.7 ha of potentially suitable habitat for the large-eared pied bat (threatened species),
- 720.5 ha of potentially suitable habitat for the koala (threatened species), and
- 111.3 ha of potentially suitable habitat for the southern greater glider (threatened species).

None of the potentially impacted threatened species have been recorded in the RTS Development Corridor. Impacts to MNES are being assessed under a separate Public Environment Report approval pathway under the EPBC Act.

6.4.1.8 Impacts Requiring Offset

Following the application of avoidance and minimisation measures, the BAM assessment identified the required biodiversity credits to offset the impacts of the RTS Project. These are listed for ecosystem credits and species credits in **Table 6.4** and **Table 6.5** respectively.

Table 6.4 Impacts Requiring Offset – Ecosystem Credits

Veg. Zone	Plant Community Type (PCT)	RTS Project – Area within Indicative Development Footprints (ha)				Total Credits Required
	Condition Class	Wind Farm	External Transmission Line	Public Road Upgrades	Total Combined RTS Indicative Development Footprints	
1	PCT 84 – River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion - *Moderate/Good*	7.9	-	1.6	9.5	146
2	PCT 281 – Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion - *Moderate/Good* [1]	0.7	12.0	0.7	13.4	427
4	PCT 479 – Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion - *Moderate/Good*	-	19.1	0.7	19.8	397
5	PCT 481 – Rough-barked Apple - Blakely's Red Gum - Narrow-leaved Stringybark +/- Grey Gum sandstone riparian grass fern open forest on in the southern Brigalow Belt South Bioregion and Upper Hunter region - *Moderate/Good*	-	12.7	-	12.7	256
6	PCT 483 – Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley - *Moderate/Good* [3]	10.5	5.7	-	16.2	570
7	PCT 483 – Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley - *Low* [4]	205.4	51.4	10.0	266.9	7,643
8	PCT 483 – Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley - *Exotic*	319.5	2.8	73.0	395.3	6,040

Veg. Zone	Plant Community Type (PCT)	RTS Project – Area within Indicative Development Footprints (ha)				Total Credits Required
	Condition Class	Wind Farm	External Transmission Line	Public Road Upgrades	Total Combined RTS Indicative Development Footprints	
9	PCT 488 – Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion - *Moderate/Good*	59.5	-	-	59.5	2,105
10	PCT 488 – Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion - *Moderate/Good-Shrubby*	0.5	-	-	0.5	11
11	PCT 488 – Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion - *Low*	198.4	1.3	5.7	205.4	5,172
12	PCT 488 – Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion - *Exotic*	360.3	-	13.1	373.4	58
13	PCT 490 – Silvertop Stringybark - Forest Ribbon Gum very tall moist open forest on basalt plateau on the Liverpool Range, Brigalow Belt South Bioregion - *Moderate/Good*	15.2	-	-	15.2	447
14	PCT 495 – Brittle Gum - Silvertop Stringybark grassy open forest of the Liverpool Range, Brigalow Belt South Bioregion - *Moderate/Good*	23.7	-	-	23.7	415
15	PCT 1661 – Narrow-leaved Ironbark - Black Pine - Sifton Bush heathy open forest on sandstone ranges of the upper Hunter and Sydney Basin - *Moderate/Good*	-	55.0	0.3	55.3	1,173

Veg. Zone	Plant Community Type (PCT)	RTS Project – Area within Indicative Development Footprints (ha)				Total Credits Required
	Condition Class	Wind Farm	External Transmission Line	Public Road Upgrades	Total Combined RTS Indicative Development Footprints	
16	PCT 1675 – Scribbly Gum - Narrow-leaved Ironbark - Bossiaea rhombifolia heathy open forest on sandstone ranges of the Sydney Basin - *Moderate/Good*	-	31.4	0.4	31.9	587
17	PCT 483 – Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley - *DNG*	101.1	26.6	0.2	127.9	2,251
18	PCT 1661 – Narrow-leaved Ironbark - Black Pine - Sifton Bush heathy open forest on sandstone ranges of the upper Hunter and Sydney Basin - *DNG*	-	2.5	-	2.5	28
-	Nil (incl. roads, tracks and waterbodies)	13.3	7.1	76.4	96.8	-
-	Category 1 – Exempt Land	52.6	13.3	2.6	68.5	-
Total		**1,368.6**	**240.9**	**184.8**	**1,794.3 5**	**27,726**

[1] *Associated with BC Act and EPBC Act listed CEECs.*

[2] *Partly associated with BC Act listed CEEC.*

[3] *Associated with BC Act and EPBC Act listed CEECs.*

[4] *Associated with BC Act listed CEEC.*

[5] *The discrepancy with the 1,794.1 ha of total impacts referenced elsewhere is due to rounding.*

Table 6.5 Impacts Requiring Offset – Species Credits

Species	RTS Project – Area within Indicative Development Footprints (ha)				Total Credits Required
	Wind Farm (ha)	External Transmission Line (ha)	Public Road Upgrades (ha)	Total Combined RTS Indicative Development Footprints (ha)	
Ausfeld's wattle	0	10.5	0	10.5	268
Glossy black-cockatoo	0	2.0	0	2	38
Large-eared pied-bat	90.6	14.1	2.0	106.7	4,839
Southern greater glider	19.3	0	0	19.3	692
Square-tailed kite	0	1.5	0	1.5	26
Squirrel glider	50.7	65.2	0.2	116.1	2,772
Eastern cave bat	92.3	14.1	2.0	108.4	4,895
Silky swainson-pea	0	17.5	0	17.5	359
Total	**252.9**	**124.9**	**4.20**	**382.0**	**13,889**

The impacts associated with the RTS Project are considered to be generally consistent with those of the Approved Project, with residual impacts to be offset through the retirement of biodiversity credits determined through the application of the BAM. Tilt Renewables has undertaken substantial impact avoidance measures to minimise the impact of the RTS Project on biodiversity values. Particular attention has been paid to reducing the impact on NSW Box Gum Woodland CEEC, which has included a substantial reduction in the number of proposed turbines.

Due to the increased extent of ground disturbance and vegetation removal proposed by the RTS Project, it would have increased impacts on biodiversity values compared with the original biodiversity assessments (NGH Environmental 2013a, 2013b and 2017), including non-threatened vegetation and species habitat as well as threatened ecological communities and species. While the extent of impacts is greater than the original biodiversity assessments (NGH Environmental 2013a, 2013b and 2017), the nature of the impacts and the biodiversity values to be impacted is consistent with the Approved Project (SSD 6696 and EPBC 2014/7136). It is important to note that the RTS Project has not changed substantially in terms of its layout and design, with turbines located along the same ridgelines and access tracks proposed in generally the same locations as the Approved Project. Material changes relate to more detailed design that has allowed for a more accurate estimate of the ground disturbance works required to construct the Project.

6.4.2 Management and Mitigation Measures

Tilt Renewables is committed to delivering a Biodiversity Offset Strategy that appropriately compensates for the unavoidable loss of biodiversity values as a result of the RTS Project as required under the BC Act and EPBC Act. This will be undertaken using one or more of the following options:

- The establishment and retirement of credits within Biodiversity Stewardship Agreement (BSA) sites.
- Securing required credits through the open credit market. And/or,
- Payments to the Biodiversity Conservation Fund.

The Development Consent allows for staging of the development and requires that the Proponent retire the required biodiversity offsets within two years of commencement of construction, or stage thereof.

Tilt Renewables is also committed to further minimise the biodiversity impacts of the RTS Project through the detailed design process. The final impacts will be confirmed following the completion of the detailed design and micro-siting of wind turbines and associated infrastructure. In this process, Tilt Renewables will seek to further minimise impacts to biodiversity values.

A range of impact mitigation measures are also proposed to mitigate the impact on ecological values prior to the consideration of offsetting requirements. These measures will be designed and described within the Biodiversity Management Plan (BMP) and Bird and Bat Adaptive Management Plan (BBAMP) that will be prepared in accordance with the relevant conditions of the Development Consent. While these management plans have not yet been prepared, the type of mitigation measures proposed for the RTS Project are presented in Table 4.4 of the BDAR (refer to **Appendix 9**).

6.4.2.1 Land-Based Offset Opportunities

Tilt Renewables has made significant progress on securing land-based offsets for the RTS Project, that together generate a large proportion of the offset credits (ecosystem credits and species credits) that must be retired for the RTS Project. Currently as of August 2023, Tilt Renewables has either formally secured or is at an advanced stage of securing a total of five land-based opportunities, which involve a mix of property acquisitions, partnership arrangements to establish new Biodiversity Stewardship Agreement (BSA) sites, and purchase of credits directly from already established BSA sites. Tilt Renewables has also been working closely with the NSW Government's Credits Supply Taskforce to explore potential credit purchase opportunities and to progress applications to establish and register the new BSA sites.

The five land-based opportunities that have been secured or in an advanced stage of being secured will generate an estimated 71% of the total ecosystem credits required for the wind farm component and public road upgrade aspects of the RTS Project. These land-based opportunities are expected to also generate a substantial number of species credits, which will be firmed up as targeted surveys are completed over the next 12 months and as sites are formally registered as BSA sites. Further details of the land-based offsets are presented in Table 8.1 of the BDAR (refer to **Appendix 9**).

6.5 Aboriginal Heritage

An Addendum Report (Umwelt 2023) to the Mod-1 Aboriginal Cultural Heritage Assessment (ACHA) (Umwelt 2022) has been prepared to assess the potential Aboriginal heritage impacts of the RTS Project. The ACHA Addendum Report (Umwelt 2023) is provided in **Appendix 10**. These ACHA reports prepared by Umwelt build on the findings of the ACHA report (and Addendum) that was prepared for the Approved Project by NSW Archaeology in 2014 and 2017 respectively.

6.5.1 Consultation

Consultation with Aboriginal parties for Mod-1 was undertaken in accordance with requirements prescribed by the National Parks and Wildlife Regulation 2019 (the NPW Regulation) and the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010a) (the consultation requirements).

Further consultation with the Registered Aboriginal Parties (RAPs) regarding the RTS Project was undertaken as part of the ACHA Addendum Report. RAPs were notified about the requirement for further assessment for the RTS Project, with RAP representatives invited to participate in the two survey programs undertaken for the Addendum ACHA. To maintain consistency and cohesion with the Mod-1 ACHA survey program, the same survey participants were invited to participate in the two separate survey programs.

The Addendum ACHA has been provided to RAPs for comment. Two responses have been received, both of which are in favour of the recommendations made in the ACHA Addendum Report. Two other groups have supplied no further comments to the report. The Project's Aboriginal Cultural Heritage Management Plan (ACHMP) will be developed in consultation with RAPs.

Full details of consultation undertaken as part of the Addendum ACHA are provided in **Appendix 10**.

6.5.2 Impact Assessment

Two additional survey programs were undertaken for the Addendum ACHA. The first survey (21 March 2023) was for sections of the external transmission line easement that were unable to be accessed during the Mod 1 assessment. The second survey (29 and 30 May 2023) was to assess the additional areas of land forming part of the RTS Project associated with the wind turbine infrastructure that had not previously been assessed, that fell within potentially sensitive landforms and/or were of significant enough size to warrant further investigation.

The surveyed area for the external transmission line was generally noted as being undulating with localised degraded sandstone outcropping. Ground surface visibility was generally poor due to consistent dense native undergrowth or pasture grasses. The additional surveyed areas for the RTS Project were generally noted as being landforms that do not provide direct access to water resources, have a slope inclination that is not conducive to camping/occupation activities, have limited depth of topsoil (within which subsurface deposits may be located) and/or have been substantially disturbed. Ground surface visibility was generally poor due to consistent dense native undergrowth or pasture grasses.

No scarring or other cultural modification was observed on any tree within the surveyed portions of the RTS Project Area. No Aboriginal objects and/or sites were identified during visual inspection. The results of the assessment and changes to potential impacts for the RTS Project are summarised as follows:

- The modified tree recorded as AHIMS #36-3-0203 is not within the RTS Development Corridor, as verified through archaeological survey, and therefore will not be impacted by the Project. This modified tree was previously identified as being within the external transmission line development corridor.
- The site Coolaburragundy River 2 (low-moderate archaeological potential - level area below spur at confluence of key watercourses) identified in the Mod-1 ACHA is no longer within the development corridor and therefore will not be impacted by the RTS Project.
- No Aboriginal cultural heritage objects or sites were identified as part of the survey and there is low potential for unknown sites to be present within the additional surveyed areas.

The RTS Project will not result in additional impacts to known Aboriginal objects when compared to the Approved Project.

6.5.3 Management and Mitigation Measures

No additional management and mitigation measures are proposed as part of the Addendum ACHA. Accordingly, preparation of the ACHMP for the RTS Project should be based on the measures set out in Section 11.0 of the Mod-1 ACHA (Umwelt 2022) and the ACHA (and Addendum) prepared for the Approved Project (NSW Archaeology, 2014/2017).

6.6 Traffic and Transport

The Traffic Impact Assessment (TIA) for the Mod-1 Assessment Report was prepared by GTA Consultants Pty Ltd (now known as Stantec). A Supplementary TIA has been prepared by Constructive Solutions Pty Ltd (CSPL) (2023) to assess the traffic and transport impacts associated with the RTS Project. The Supplementary TIA (CSPL 2023) is provided in **Appendix 11**. Appendix 7 of the Supplementary TIA includes the updated Over-size Over-mass (OSOM) Route Study (Rex J Andrews 2023).

6.6.1 Impact Assessment

The Supplementary TIA has assessed the potential traffic and transport impacts associated with the proposed changes to the Mod-1 Project and the Approved Project as well as identifying the required road upgrade and repair treatments within the relevant LGAs. The key activities undertaken and traffic and transport assumptions when considering the potential impacts of the RTS Project have included:

- Further design was completed for the RTS Project based on detailed 3D terrain modelling, providing a more robust estimate of bulk earthworks required and demand for rock, gravel and sand material. This has allowed more detailed trip generation estimates for the RTS Project.
- A detailed audit was undertaken of the existing condition of public roads and intersections (including bridges, culverts and causeways) proposed to be used by construction traffic.
- Selection of the preferred turbine (Vestas V172 7.2 MW) provides more certainty on the vehicle numbers, weights, dimensions, and swept paths of OSOM vehicles that will be required to construct the RTS Project.
- More detailed traffic estimates provided by Tilt Renewables using a sophisticated traffic generation estimation model informed by recent wind farm construction experience at the Rye Park Wind Farm.
- Completion of intersection analyses, together with OSOM swept path details, to inform the proposed upgrade of affected intersections.
- Consultation with relevant roads authorities including WSC, UHSC, and TfNSW leading to further refinement of key assumptions that inform the traffic generation estimates and basis of design for upgrade and repair treatments.

The key traffic and transport amendments proposed by the RTS Project compared to the Mod-1 Project are as follows:

- No Project access via Coolah Road. Access to the F Cluster turbines will be from Rotherwood Road for all light vehicles (LV), heavy vehicles (HV) and OSOM vehicles.
- No OSOM vehicle access along the first 2.9 km of State Forest Road (measured from the intersection with Coolah Creek Road). OSOM vehicles will access the turbine clusters via the internal wind farm access track off Coolah Creek Road through the D Cluster and on to State Forest Road at the 2.9 km mark.
- Reduction of approximately 7.4 km in length of regional/local roads proposed to be used for Project access. Approximately 110 km of regional/local roads will be required to access the wind farm and approximately 49 km of regional/local roads will be required to access the external transmission line.
- Reduction in the total number of proposed site access points by 16. A total of 34 site access points will be used for the wind farm (21 are existing) and 40 site access points for the external transmission line (21 are existing).
- Construction duration has increased from approximately 160 weeks to approximately 200 weeks.
- Minor amendment to the proposed OSOM haulage route by removing Edderton Road as an optional route around Denman Bridge in Denman (road upgrades between the Port of Newcastle and the Project site to be undertaken by TfNSW on behalf of EnergyCo).

Estimated total construction related traffic volumes for the RTS Project are summarised in **Table 6.6.** These volumes will be distributed across the various road segments affected by wind farm construction. Traffic volumes have been assumed based on the supply of quarry materials via the proposed on-site quarry located near Rotherwood Road, Cassilis. It is important to note that further refinement of the traffic generation estimates will be undertaken once the preferred BOP contractor has been appointed for the construction of the RTS Project (expected to occur in late 2023) and will be reflected in the Traffic Management Plan required under the existing conditions of the Development Consent.

Table 6.6 RTS Project Total Construction Vehicle Movements

Total Vehicle movements (one way trips)	HV	OSOM	LV	Grand Totals
Public Road Upgrades	27,183	0	8,550	35,733
Wind farm	75,756	2,253	100,893	178,901
RTS Project Total	102,938	2,253	109,443	214,634
Peak one way daily movements	160		178	337

The Project amendments have resulted in changes to the anticipated traffic generation associated with the RTS Project compared to the Mod-1 Project and Approved Project as detailed in **Table 6.7.**

Table 6.7 Traffic Analysis Comparison Summary

Traffic Generated	Approved Project	Mod-1 Project	RTS Project
Estimated peak traffic generation during the construction phase (one-way vehicle movements per day)	325	304	337
Number of daily operational trips for scheduled and unscheduled turbine maintenance	30	30	28
Estimated total traffic during the construction phase (one way vehicle movements):	233,108*	122,246	214,634
• **LV**	189,580	24,999	109,443
• **HV**	40,054	94,345	102,938
• **OSOM**	3,474	2,902	2,253

**Does not include construction traffic associated with public road upgrades.*

Based on the revised assumptions used in the traffic generation model, the RTS Project is anticipated to result in a 4% increase in the peak one-way daily construction movements compared to the Approved Project. For total construction traffic numbers, while the estimated HV movements during construction have increased substantially compared to the Approved Project, overall the RTS Project is anticipated to result in a decrease in total vehicle movements during the construction phase.

Given the reduction in the number of turbines proposed by the RTS Project compared to the Approved Project, the overall traffic movements during the operational phase for the RTS Project are marginally lower in comparison to the Approved Project.

The increase in total one-way construction traffic movements from the Mod-1 Project to the RTS Project is due in main part to a refinement of the assumptions related to LV movements. Through consultation with WSC, the base assumption made for the Mod-1 Project of three workers per LV was revised to one worker per LV, which has led to a substantial increase in the estimated total one-way LV movements over the entire construction phase. This is a conservative estimate as many of the one-way LV trips will be made with more than one worker present, based on Tilt Renewables' prior experience with construction of other wind farm projects, including the Rye Park Wind Farm, located near Yass, NSW that is nearing completion.

The Supplementary TIA concluded that overall the RTS Project is expected to have a similar traffic impact compared to the Approved Project and is unlikely to have a significant adverse impact on the safety and efficiency of the road network.

6.6.1.1 OSOM Assessment and Upgrades

All anticipated pinch points along the OSOM haulage route between the Port of Newcastle and the Project site, based on the preferred turbine parameters for the Vestas V172 7.2 MW turbine, have been identified in the detail OSOM route study prepared for the RTS Project (Rex J Andrews 2023) that is included as an appendix to the Supplementary TIA (Constructive Solutions 2023) (refer to **Appendix 11**).

As the Project is located within the CWO REZ and recognising that Tilt Renewables is a Candidate Foundation Generator (CFG) within the CWO REZ, EnergyCo and TfNSW have committed to undertake all upgrades to the State Road network required to facilitate OSOM movements between the Port of Newcastle and the Project site. The required upgrade works, and associated approvals will be obtained and undertaken by TfNSW on behalf of EnergyCo to enable the passage of OSOM loads for the Project. Tilt Renewables will continue to work closely with EnergyCo and TfNSW to ensure the upgrade works are designed and delivered in a fit-for-purpose and timely manner.

Tilt Renewables is responsible for the upgrades to facilitate OSOM vehicle movements along Vinegaroy Road and all local roads proposed to be used off Vinegaroy Road.

6.6.2 Management and Mitigation Measures

To ensure the safety and efficiency of the public road network Tilt Renewables is proposing a suite of upgrades and repairs to relevant public roads, intersections, structures (including bridges, culverts and causeways) based on anticipated vehicle movements and types. The suite of upgrades/repairs have been prepared in consultation with WSC and UHSC, and are set out in the Supplementary TIA prepared for the RTS Project (Constructive Solutions 2023) (refer to **Appendix 11**).

Along specific segments of public roads within WSC LGA Tilt Renewables proposes to remove the existing seal, and construct the required formation width and pavement design in order to meet the required safety standards. Those segments of public roads would remain unsealed during the construction phase through to when the relevant road segments are handed back to the road authority. Prior to hand-back to the road authority, a new bitumen seal will be applied to the minimum width as agreed with the road authority, at which point the road authority would be responsible for the ongoing maintenance of the relevant road segments after the last OSOM movement along relevant public road segments, and beyond. The relevant road segments where this approach is proposed are listed in **Table 6.8**.

A number of mitigation measures will be undertaken by Tilt Renewables during the construction phase along these road segments to address potential safety and amenity issues, as follows:

- Widening on corners to accommodate site lines and OSOM movements where relevant.
- The construction phase design will be widened to accommodate the construction traffic volumes modelled.
- Watering for dust suppression.

A targeted consultation program will be undertaken with residences located along the local roads listed in **Table 6.8** prior to commencement of any upgrades or repair treatments. Further information is provided in the Supplementary TIA (refer to **Appendix 11**).

Table 6.8 Sealed to Unsealed Public Road Treatment During Construction

Road Name	Start Chainage (km)	End Chainage (km)	Length (km)	Comment
Pandora Road	0	1.7	1.7	Road segment between State Forest Road and Coolaburragundy River.
Rotherwood Road	0.5	9.1	8.6	Majority of existing sealed section.
Turee Vale Road	2.7	6.8	4.1	Majority of existing sealed section.

6.7 Electromagnetic Interference

The EMIA (WSP 2022) prepared for the Mod-1 Assessment Report has been revised and updated to assess the amendments to the Approved Project proposed as part of the RTS Project. The revised EMIA (WSP 2023) is provided in **Appendix 12**.

6.7.1 Impact Assessment

The EMIA considered the change in potential EMI impacts from the Mod-1 Project to the RTS Project through the removal of 35 wind turbines, a revised wind turbine layout, and decrease to the indicative wind turbine envelope (based on the Vestas V172 7.2 MW turbine).

The EMIA included an analysis of:

- Fixed point to point radio communication links in the vicinity of the proposed turbine locations.
- Fixed point to multipoint licenses within 30 km of the site.
- Radar operations within 250 nautical miles of the site.
- Television and radio broadcasting services in operation around the LRWF Project.
- Mobile phone services.
- Internet services.
- Licences operated by emergency services in proximity to the development.

Existing radio communication services were identified from the Australian Communications and Media Authority (ACMA) database register of radio licences, radio communication towers and radio services (RADCOM). The RADCOM database was accessed in December 2020 and not re-accessed as part of the RTS Project EMIA. The database identified 385 radio communication sites within 75 km of the approximate Project area and 39 towers located within 30 km of the Project area. Based on these results, communication towers and point-to-point links in the vicinity of the Project area were selected for further investigation.

Consultation with licensees within 10 km of the Project was undertaken in June 2020 regarding the Mod-1 Project 226 turbine layout. The same licensees were contacted again in June 2021 with an updated 223 turbine layout. For the RTS Project 185 turbine layout, no further consultation was conducted. A summary of consultation with licensees is presented in **Appendix 12**.

The key findings of the EMIA are summarised below.

6.7.1.1 Point-to-Point Links

Four existing and one proposed (NSW Telco) point-to-point links are located in the vicinity of the RTS Project turbine locations. To avoid all potential EMI impacts on the links, no turbine (including blade tip) should encroach the 2nd Fresnel zone of the link. The RTS Project turbine layout would not encroach into the 2nd Fresnel zones of the four existing links.

To avoid impact to the proposed NSW Telco link, Tilt Renewables has relocated three turbines (D40, D43 and E31) from the Mod-1 layout. As such, there would be no impact on the five point-to-point links for the RTS Project turbine layout.

6.7.1.2 Point-to-Multipoint Licences

No point-to-multipoint (P2MP) licences intersect the Project site boundary. According to the ACMA database, the closest P2MP is Site ID 201640 (Comms Site Mt Tamarang) located approximately 21.9 km from the Project site boundary. Due to the extended separation distance from turbines, it is unlikely the RTS Project will have any adverse EMI impacts on the registered P2MP licences.

6.7.1.3 Land Mobile Licence

One land mobile licence belonging to Betrola Investments Pty Limited (Betrola) may be impacted by the RTS Project. Betrola operates a land mobile radio licence for communicating between two properties with the Yarralee repeater (Site ID 10013037) located approximately 7 km east of the Project boundary. Betrola have indicated that the Yarralee repeater is used by land mobile receivers, spanning across the Betrola property.

Depending on the location of the land mobile receiver within the Betrola property boundaries, two turbines (E14 and E16) may obstruct the line of sight and hence lead to a potential deterioration of the signal strength. If this does occur, a potential mitigation strategy would be a minor adjustment in the position of the receiver to improve the line of sight between the tower and the receiver.

Tilt Renewables has made a commitment (as part of the Modification Application) to undertake a pre-construction signal survey at the Betrola property prior to construction of the relevant turbines to gain a baseline understanding of the existing signal strength and quality at that time. If it is determined post turbine construction that mitigation is required, Tilt Renewables will implement reasonable and feasible measures to ensure the existing signal quality is maintained. Betrola has confirmed that this approach is supported.

6.7.1.4 Mobile Phone Reception

Existing mobile phone reception is observed to be either marginal, or non-existent within and surrounding the Project site. As such, limited disturbance is expected by the RTS Project.

6.7.1.5 Television Reception

A search of the digital TV broadcast stations was conducted in proximity to the Project. The two closest broadcasting towers in the area surrounding the Project are in Coolah (Prime TV) and Cassilis (NBN). Within and surrounding the Project site, TV reception ranges from no coverage to marginal.

There are approximately 202 dwellings within 5 km of the Project boundary. If a turbine obstructs the line of sight of nearby broadcast stations, residences may experience interference to their existing TV coverage. As existing TV coverage is considered marginal, Tilt Renewables proposes to undertake a pre-construction ground survey of TV signal strength at a representative subset of residences within 10 km of a proposed turbine. A post-construction TV signal strength survey would also be undertaken at the same residences, and at locations shown to experience TV interference due to the presence of the wind farm, further mitigation options, as set out in **Section 6.7.2** will be considered.

6.7.1.6 Radar and Meteorological Services

The nearest major regional airport to the Project is Mudgee Airport, located approximately 68 km to the south west. The nearest International Airport is Sydney Airport located approximately 325 km north northwest of the Project. Potential impacts on aviation radar services, if any, are not likely to be of operational significance at these distances. Through consultation, Airservices Australia acknowledged that the Project will not adversely affect their services and the Department of Defence also noted they have no objections to the Project.

A search of automatic weather stations (AWS) surrounding the Project was conducted using the Australian Bureau of Meteorology (BoM) 'Climate Data Online' database. The closest AWS is Merriwa Roscommon (Station Number 61287) located approximately 50 km from the Project. Based on the BoM website, seven meteorological radars have been identified within 250 nautical miles (approximately 460 km) of the Project. The closest radar station was observed to be Namoi (Blackjack Mountain) located approximately 95.7 km from the Project.

In consultation, the BoM identified that nearby fixed services would not be impacted by the Project, however, the S-band radar at Namoi would be impacted at least in its first scan. Tilt Renewables has been in detailed discussions with the BoM to gain a better understanding of the extent of potential impacts to the Namoi radar and to work collaboratively on a viable solution to maintain the existing quality of weather-related information that is provided for the area. This work is ongoing.

6.7.1.7 Emergency Service Providers

A search of radiocommunication sites operated by emergency service providers within 30 km of the Project identified four providers: Ambulance Service of NSW, NSW Police Force, NSW Rural Fire Service (RFS) and NSW Volunteer Rescue Association (VRA). Emergency service providers were contacted as part of the consultation process. Responses were received from the NSW Police Force, RFS and VRA. The NSW Police Force and VRA both stated that there would be no impact to their services. The NSW RFS requested that Tilt Renewables measure the transmission clarity and strength, pre- and post-wind farm construction.

6.7.1.8 Comparison of Approved Project and RTS Project

The telecommunications impact assessment prepared by Epuron Pty Ltd in support of the Original EIS/RTS found that no adverse impacts were anticipated, including impacts on existing telecommunications and aviation navigation services. Several mitigation strategies were proposed to address any potential unforeseen impacts.

These results are in line with the EMIA undertaken for the RTS Project such that any potential impacts would be addressed through proposed mitigation measures.

The RTS Project will not impact the ability to comply with Condition 36 of Schedule 3 of the Development Consent that relates to radiocommunication. In accordance with Condition 36 of Schedule 3, the Applicant must implement mitigation measures within one month following any disruption as a result of the development.

6.7.2 Management and Mitigation Measures

No additional management and mitigation measures are proposed for the RTS Project.

The existing Condition 36 of Schedule 3 of the Development Consent requires Tilt Renewables to make good any disruption resulting from the Project to any radio communications services (including point-to-point microwave links) in the area as soon as possible following the disruption. This condition will continue to apply to the RTS Project.

6.8 Aviation

The AIA (Aviation Projects 2022) prepared for the Mod-1 Assessment Report has been revised and updated to assess aviation impacts associated with the further RTS Project amendments to the Approved Project. The revised AIA (Aviation Projects 2023) is provided in **Appendix 13**.

6.8.1 Impact Assessment

The AIA has determined the potential impacts of the RTS Project to certified airports, aircraft landing areas (ALAs), air routes, lowest safe altitude parameters, military operations, aviation facilities, radar operation and the need for obstacle lighting. The AIA also identifies management and mitigation measures and provides a comparison of the Approved Project and RTS Project.

6.8.1.1 Certified Airports

One certified airport, Coolah Airport (YCAH), is located within 30 nautical miles (nm) (55.56 km) of the RTS Project. Thirty nautical miles is the distance used to identify possible constraints. Coolah Airport is a certified, code 2, non-instrument approach runway, operated by Warrumbungle Shire Council. For this type of airport the obstacle limitation surfaces (OLS) extend up to 2,500 m, generally as a radius from the ends of the runways. Coolah Airport is located approximately 18 km (9.6 nm) west of the nearest RTS Project turbine (A1). Therefore, the RTS Project will not impact Coolah Airport's OLS.

As Coolah Airport is not served by instrument or non-precision approach procedures there are no procedures for air navigation services – aircraft operations (PANS-OPS) surfaces.

The RTS Project is located beyond 30 nm from Coonabarabran Airport (YCBB), Dubbo Airport (YSDU), Mudgee Airport (YMDG), Quirindi Airport (YQDI), Scone Airport (YSCO) and Tamworth Airport (YSTW). Therefore, the RTS Project will not impact on the operational airspace of these airports.

6.8.1.2 Aircraft Landing Areas

A review of aerial imagery and OzRunways data was used to identify ALAs within proximity to the Project site. A 3 nm radius area of interest around an ALA is used to assess potential impacts of proposed developments on aircraft operations at or within the vicinity of the ALA. Initially, 48 unregulated (i.e. not certified) ALAs were identified with further analysis determining that the majority of the ALAs were likely to be non-operational or located more than 3 nm from a turbine.

The ALA analysis identified 11 ALAs located within proximity of the Project to be investigated further (refer to **Figure 6.1**). The assessment determined that the RTS Project layout would not impact the approach and departure paths or the aerodromes' circuit operations for 5 of the 11 ALAs. Five other ALAs were identified as having a turbine within a 3 nm radius, however, it was concluded that the approach and departure paths and aerodromes' circuit operations were unlikely to be affected by the RTS Project layout. For two ALA (ALA 2 located 3 km north west of turbine D5, and ALA 9 located 450 m north west of turbine D54) it was identified that the turbines within 3 nm would be considered potentially hazardous obstacles for circuit operations. The report concluded that consideration should be given to aircraft operating from/to the north west during approach/take-off for ALA 2.

The effects of wake turbulence can be noticeable up to a distance of 16 times the turbine rotor diameter (National Airport Safeguarding Framework NASF (NASF) Guideline D - Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers 2013). For the wake turbulence analysis a 172 m rotor diameter was used giving a distance of 2,752 m.

The analysis identified that the effects of wake turbulence could potentially be noticeable at ALA 1, ALA 2, ALA 3, ALA 4, ALA 9 and OZDAK ALA, in the following circumstances:

- while performing the southern right hand circuits at ALA 1
- while departing to the south-east at ALA 2
- when operating in the southern circuit at ALA 3
- while departing to the north-west at ALA 4
- while operating in the vicinity of ALA 9
- when operating in the northern circuit at OZDAK ALA.

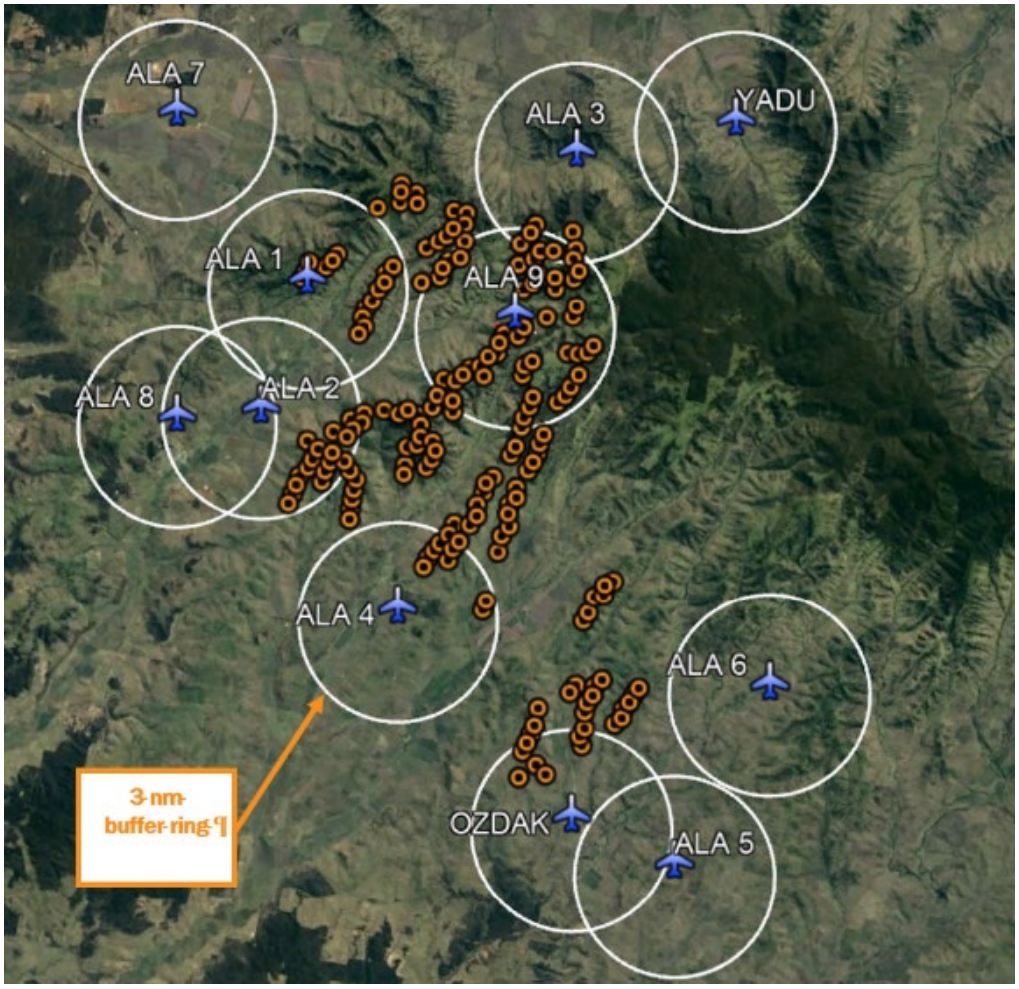


Figure 6.1 ALAs in proximity to the RTS Project

6.8.1.3 Air Routes and Lowest Safe Altitude

The Project site is located within 3 grid lowest safe altitudes (LSALTs). The grid LSALT where the highest RTS Project turbine (C18) is located is 1,646 m AHD with a minimum obstacle clearance surface of 1,341 m AHD. The grid LSALT will not be impacted by the highest RTS Project turbine C18.

6.8.1.4 Military Operations

The Project site is located outside controlled airspace (wholly within Class G airspace), within the Restricted Area R559B, adjacent to the Restricted Area R559D and within the Danger Area D538B associated with Royal Australian Air Force (RAAF) Base Williamtown military restricted airspace.

All RTS Project turbines within the Restricted Area R559B and adjacent to the Restricted Area R559D will be below the applicable vertical restriction limits (from 10,000 feet above mean sea level (ft AMSL) up to flight level 260). However, the RTS Project turbines are located within the Danger Area D538B, which is operated between surface and 10,000 ft AMSL. Low level military flight operations within Danger Area D538B will need to be conducted in consideration of the RTS Project turbines.

6.8.1.5 Aviation Facilities

The RTS Project turbines will not penetrate any protection areas associated with aviation facilities. The protection areas for the applicable aviation facilities (non-directional radio beacons – NDB) extend to a distance of 300 m.

6.8.1.6 Radar

The Project site is located in Zone 4 (accepted zone) and outside the radar line of sight of Mt Sandon secondary surveillance radar (SSR), Mt Boyce route surveillance radar (RSR), Williamtown tactical air command, Cecil Park SSR and primary surveillance radar (PSR), Sydney SSR and PSR, and the Round Mountain RSR, and will not interfere with the serviceability of these aviation facilities.

6.8.1.7 Obstacle Lighting Risk Assessment

A safety risk assessment of the RTS Project concluded that the proposed turbines and permanent wind monitoring towers (also referred to as met masts) will not require obstacle lighting to maintain an acceptable level of safety to aircraft.

6.8.1.8 Comparative Assessment – Approved Project and RTS Project

An Aviation Impact Assessment (dated 9 February 2017) was prepared by REHBEIN Airport Consulting that assessed the potential aviation impacts related to the Approved Project. The REHBEIN Airport Consulting report assessed the potential aviation impacts associated with a 282 wind turbine layout and maximum blade tip height of 165 m AGL.

To understand the extent of change in potential aviation impacts associated with the Approved Project and the RTS Project, a comparative assessment was undertaken of the key findings of the REHBEIN Airport Consulting report and the current AIA (Aviation Projects 2023). It was determined that the findings of the current AIA are consistent with those of the REHBEIN Airport Consulting report carried out for the Approved Project.

In summary, the potential impacts associated with the RTS Project are generally consistent with those identified for the Approved Project. With the implementation of mitigation measures as set out in the revised AIA, all identified potential impacts can be appropriately managed. The RTS Project will not impact the ability to comply with the Conditions of Approval relevant to aviation, being Condition 5(b)(C) and Conditions 31 and 32 of Schedule 3.

6.8.2 Management and Mitigation Measures

No additional management and mitigation measures are proposed for the RTS Project.

As the maximum blade tip height has been reduced by 35 m compared to the Mod-1 Project, the need to increase the grid LSALT by 30 m and consult with Air Services Australia is no longer required.

Conditions of the existing Development Consent require the Project to carry out the following:

- Development to be carried out in accordance with National Airports Safeguarding Framework Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers, or its latest version.

- Prior to construction CASA must be provided the final height and location of each turbine.
- If requested by an owner adjacent to the Project Site, Tilt Renewables must implement mitigation measures for situations where pre-existing aerial agricultural activities are affected by the erection and/or operation of wind turbines.

The RTS Project will comply with these conditions.

6.9 Social

The assessments undertaken for the Original EIS and Mod-1 Assessment Report focused on economic benefits and impacts of the Project as well as property values. A Social Impacts and Management Overview (SIMO) Report (Umwelt 2023) and Accommodation and Employment Framework (AEF) Report (Umwelt 2023) have been prepared to identify potential social impacts and opportunities as well as available management and mitigation measures for the RTS Project. The SIMO constitutes a desktop review of social conditions in the Project's social locality and includes a high-level assessment of potential social impacts and management options, based on existing and available information. The SIMO and AEF are presented in **Appendix 14** and **Appendix 15** respectively.

6.9.1 Impact Assessment

6.9.1.1 Social Impact

Potential social impacts likely to be associated with the Project have been identified with a life-cycle focus, with consideration of Project design, construction, operation, and decommissioning activities. Impacts have been categorised according to social impact categories, including way of life, community, accessibility, culture, health and wellbeing, surroundings, livelihoods, and decision-making systems.

An overview of the key issues related to potential social impacts raised in relation to the Project during Tilt Renewables' community engagement activities and submissions received during public exhibition of the Modification Application is provided below. A more detailed analysis of potential impacts raised by community members is provided in Table 5.1 of **Appendix 14.**

Identified potential impacts are presented in **Table 6.9** below.

Table 6.9 Potential Social Impacts

Social issue	Potential impact
Way of Life and Community	• Changing sense of place due to industrialisation of the rural environment. • Reduced social amenity impacts because of noise associated with construction activities. • Employment and procurement opportunities through project construction and operation phases. • Community division and a decrease in social cohesion because of differing perspectives and levels of acceptance of the project. • Change in community composition given presence of incoming project workforces in small population centres.

Social issue	Potential impact
Accessibility	• Electromagnetic interference causing disruption to mobile phone communications, UHF radio, EPIRB safety beacons and radio. • Disruption and increased travel times due to public road upgrades. • Inability to undertake aerial operations such as baiting and firefighting, compromising public safety. • Reduced availability and affordability of short-term accommodation and rental accommodation within the region given demand for housing/accommodation by the project's construction workforce.
Culture	• Construction and operational activities impacting connection to country and ongoing cultural practices and values.
Surroundings	• Loss of ecological species e.g., bird and bat strike, given presence of turbines. • Change in the rural vista and sense of place given the presence of multiple wind turbines e.g. visual impacts from key public viewing points in Coolah Top National Park. • Reduced social amenity for visitors camping in the Coolah Tops National Park given noise from construction and operations. • Increased land management costs and activities due to spread of pests and weeds.
Livelihoods	• Reduced ability to undertake aerial agricultural activities, impacting on local livelihoods. • Reduction in property values given proximity to and view of the wind farm. • Reduced tourism in the area due to perceived industrialisation of the landscape.
Decision making systems	• Consultation fatigue from long Project development timelines and multiple concurrent renewable energy projects in the social locality. • Community scepticism about quality of environmental impact assessment reducing trust in assessment processes.
Health and well-being	• Sleep disturbance as a result of operational noise from turbines. • Reduced public safety given increased traffic associated with construction activities.

6.9.1.2 Accommodation and Employment

An Accommodation and Employment Framework (AEF) (Umwelt 2023) has been prepared for the Project. An overview of the AEF is provided below with the full document presented in **Appendix 15**.

The AEF was developed with the goal of ensuring that the Project is cognisant and respectful of local community feedback. The objectives of the AEF are as follows:

- To respond to the community, council and agency concerns around temporary workforce accommodation and local employment opportunities.
- To complement and extend the Industry and Aboriginal Participation Plan (IAPP) currently under development for the Project and the Australian Industry Participation (AIP) Plan currently in place for Tilt Renewables.

- To detail the consultation and analysis undertaken to-date to support consideration of accommodation and employment and procurement opportunities associated with the Project.
- To maximise the capacity for Tilt Renewables to generate local benefits through local procurement and employment outcomes.
- To identify options for the effective and appropriate accommodation of the workforce associated with the Project.
- To assist in managing the social impacts and opportunities associated with the development and management of a temporary workforce campsite(s) designed to house workers involved in the construction of the Project.

Peak construction for the project is expected reach approximately 550 workers. Key jobs during construction will include operators, project managers, mechanical management, labourers, installation experts and technicians. The construction period of the wind farm is expected to commence in mid-2024 and conclude in mid-2028.

Apart from direct employment opportunities associated with the development itself, the employment benefits are expected to extend through the local supply chains to include vehicle and equipment servicing, uniform suppliers, cafés, pubs, catering and cleaning companies, tradespersons, tool and equipment suppliers and many other businesses.

The AEF provides an overview of baseline economic, social and housing contexts surrounding the Project. It has identified substantial housing, accommodation and employment and procurement constraints in the social locality, often linked to the Project's remote location. The impact of the Project has been considered, with additional analysis to assess cumulative impacts of concurrent proximal projects. It has also identified existing regional strengths, including regional expertise in mining and construction sectors and access to land with the capacity to host campsites for workers.

The AEF includes several recommendations to enhance positive social outcomes and mitigate potential negative social outcomes for the Project. These include:

- Establishing a temporary workforce accommodation facility (or potentially one smaller facility and one larger facility) to host construction workforces in/around Cassilis (Upper Hunter Shire LGA) or Coolah (Warrumbungle Shire LGA).
- Proactively engaging with short-term accommodation providers to communicate timing of accommodation needs.
- Consider limiting the number of short-term accommodation beds accessed to less than 95 accommodation beds across the Study Area on any given night. The Study Area refers to the regions and townships most likely to be impacted by the Project, including Warrumbungle Shire LGA, Upper Hunter Shire LGA and the Mid-Western Regional Council LGA. This is designed to avoid 'crowding out' effects on other accommodation users.
- Establishing and maintaining the Tilt Renewables Goods and Services Register database and making this available to manufacturers and the head contractors to support local procurement.

- Implementing a requirement in contracts that procurement entities comply with Tilt Renewables Australian Industry Participation Plan (AIP) and Industry Aboriginal Participation Plan (IAPP). Information and support will be offered through a workshop that outlines the AIP requirements, including local procurement.

The AEF identified substantial opportunities to house the anticipated construction and operational workforces, employ workers and procure goods and services while also maximising social benefits to communities and reducing potential negative impacts. Proactive management and monitoring of outcomes will be achieved through post-approval management strategies and mechanisms.

6.9.2 Management and Mitigation Measures

Tilt Renewables has several existing arrangements in place designed to directly fund infrastructure and initiatives in the region. This includes a Voluntary Planning Agreement (VPA) with a dedicated Community Enhancement Fund and CWO REZ access fees that help to form the basis for community enhancement and employment program funding within the vicinity of the Project.

The additional management and mitigation measures associated with the RTS Project are set out in the SIMO and AEF reports contained in **Appendix 14** and **Appendix 15**.

7.0 Justification of the RTS Project

This section provides a justification of the RTS Project, taking into consideration the environmental, social and economic impacts, as compared to the Approved Project, as well as considering the strategic context and suitability of the Project site. The RTS Project is also considered in the context of the principles of ecologically sustainable development (ESD) as defined in Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation).

7.1 Environmental, Economic and Social Impacts

The changes proposed by the RTS Project were developed in response to ongoing consultation with agencies, progression of detailed design, and submissions received during the Mod-1 exhibition period. Tilt Renewables, in consultation with landowners and agencies, has sought to progress the design and reduce environmental impacts wherever possible. Key changes from the Mod-1 Project to the RTS Project have been a reduction in the development corridor, a reduction in turbine numbers, a reduction in turbine height, reduction in the internal transmission line length, reduction in the length of public road to be utilised and reduction in total number of site access points. These design changes have been assessed and it is considered that the Project amendments would not result in any unacceptable impacts and that the Project can comply with statutory requirements and relevant standards, policies and guidelines.

For most environmental aspects there would be no substantial change to impacts and/or a positive outcome as a result of the RTS Project when compared with the Mod-1 Project or Approved Project.

7.2 Strategic Context

NSW is in a transition to build a reliable, affordable and sustainable electricity future with the NSW Government taking action to deliver cheap, reliable, and clean electricity for homes and businesses in NSW (EnergyCo, 2023a). The CWO REZ was formally declared on 5 November 2021 under the *Electricity Infrastructure Investment Act 2020* with the Project representing one of the largest approved projects within the REZ. The NSW Government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the retirement of thermal power stations over the coming decades.

The amendments that make up the RTS Project do not change the overall strategic context of the Project. The Project is aligned with the strategic direction of the NSW and Australian energy generation market and will assist in achieving the planned transition to an increased contribution of renewable energy to Australia's energy needs. Located within the CWO REZ, the Project is within a defined area planned for renewable energy development by the NSW Government. Tilt Renewables, as an existing renewable energy operator in Australia with a track record of delivering large-scale renewable energy projects, is well placed to progress the delivery of the Project.

7.3 Suitability of the Site

The RTS Project incorporates very few changes to the site boundary of the Approved Project. The focus of the amendments within the Project site has been on developing a productive design that is constructable and allows for some reduction in environmental and social impacts where possible. The RTS Project has considered these aspects through consultation with landowners as to how the Project could best be accommodated within their individual landholdings. As such, it is considered that site suitability has been progressed and improved from that identified by the Mod-1 Project.

7.4 Ecologically Sustainable Development (ESD)

To justify the RTS Project with regard to the principles of ESD, the benefits of the RTS Project in an environmental and socio-economic context should outweigh any negative impacts. The principles of ESD encompass the following:

- The precautionary principle.
- Intergenerational equity.
- Conservation of biological diversity.
- Valuation, pricing and incentive mechanisms.

An assessment of the RTS Project against the principles of ESD is provided in the sections below.

7.4.1.1 The Precautionary Principle

The EP&A Regulation defines the precautionary principle as:

> *'if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*
>
> - *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment*
> - *an assessment of the risk-weighted consequences of various options.'*

In order to achieve a level of scientific certainty in relation to potential impacts associated with the proposed amendments to the Approved Project as part of the RTS Project, extensive evaluation of all the key components of the Project has been undertaken at the Mod-1 and RTS stages. Detailed assessment of all key issues and necessary management measures has been undertaken and is comprehensively documented in the Mod-1 Assessment Report and this Amendment Report.

The assessment process has involved detailed studies of the existing environment, and where applicable the use of scientific modelling to assess and determine potential impacts as a result of the RTS Project. To this end, there has been careful evaluation to avoid/minimise the risk of irreversible damage to the environment, wherever possible.

The decision-making process for the design, impact assessment and development of management processes has been transparent through the consultation process with both government authorities, landowners and the community.

Consistent with the precautionary principle, the environmental assessment of the Project has sought to minimise environmental impact through the avoidance of impacts and a range of mitigation measures are proposed to address identified residual impacts.

7.4.1.2 Intergenerational Equity

The EP&A Regulation defines the principle of intergenerational equity as:

> *'... that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.'*

Intergenerational equity refers to equality between generations. It requires that the needs and requirements of today's generations do not compromise the needs and requirements of future generations in terms of health, biodiversity and productivity.

The RTS Project is considered to be consistent with the principle of intergenerational equity as it can be carried out in a way that would maintain the health, diversity and productivity of the environment now and into the future. The key benefit of the RTS Project will be Project's strong contribution to energy capacity, reliability and security in the transition away from coal-fired power generation to renewables.
The amendments proposed to the Approved Project enable more electricity to be generated with much fewer, more efficient wind turbines and ensure that the Approved Project is fully constructible.
The changes to the Project have been designed in close consultation with host landowners to allow ongoing agricultural uses to continue and be further supported by the additional revenue from the Project.

7.4.1.3 Conservation of Biological Diversity

The EP&A Regulation identifies that the principle of conservation of biological diversity and ecological integrity should be a fundamental consideration in the decision-making process. The conservation of biological diversity refers to the maintenance of species richness, ecosystem diversity and health and the links and processes between them.

The RTS Project includes measures to minimise impacts on the abundance and distribution of flora, fauna and ecological communities for the short and long term, including but not limited to:

- Reduction in the number of turbines and turbine blade length.
- Development and implementation of biodiversity offsets strategy in accordance with the requirements of applicable state and Commonwealth polices and regulations.

All environmental components, ecosystems and habitat values potentially affected by the RTS Project have been assessed in the BDAR which includes detailed measures to avoid and minimise impacts to biodiversity.

7.4.1.4 Valuation Principle

The goal of improved valuation of natural capital is included in Agenda 21 of Australia's Intergovernmental Agreement on the Environment. The principle has been defined in the EP&A Regulation as follows:

> *… that environmental factors should be included in the valuation of assets and services, such as:*
>
> *(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement;*
>
> *(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste; and*
>
> *(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

Tilt Renewables has intrinsically valued the environmental resources by designing the RTS Project to avoid and minimise potential environmental and social impacts as much as practicable. The RTS Project is considered to be consistent with the valuation principle of ESD as Tilt will be required to pay the full costs associated with:

- Ensuring the Project is designed and implemented in accordance with the relevant standards.
- Offsetting residual impacts to biodiversity in accordance with State and Commonwealth guidelines.
- Management measures to minimise potential environmental and social impacts.

Implementing the mitigation measures for the RTS Project would impose an economic cost on Tilt Renewables, increasing both the capital and operating costs of the Project so to provide sound environmental outcomes. In this manner, environmental resources have been given appropriate valuation.

The Project is considered ecologically sustainable, due to the social, economic and environmental benefits discussed, and the mitigation measures put in place to protect from adverse impacts on the environment.

7.5 Conclusion

The Project is a direct response to the NSW and Commonwealth Governments' commitments to transition to renewable electricity generation and forms a key component of the CWO REZ, an area confirmed as suitable for renewable energy development by the NSW Government. The amendments that make up the RTS Project do not change the overall strategic context of the Approved Project. The National Electricity Market (NEM) needs to rapidly transition to renewable energy to support the NSW Climate Change Policy Framework, as well as the Commonwealth Government's commitments under the Paris Agreement. At present, additional renewable energy capacity is being added to the NEM at a lower rate than what the Australian Energy Market Operator has identified as required to achieve the transition to renewable energy (Parkinson, 2023). The RTS Project will materially assist in addressing this shortfall by delivering approximately 1,332 megawatts (MW) of renewable energy capacity to the NEM to help replace the generation capacity which will be lost when NSW's largest power station, Eraring, closes in 2025.

Further, as outlined in **Section 7.4**, the RTS Project is consistent with the principles of ESD. The Project will also contribute significant capital investment within the CWO region, generate jobs during the construction and operational phases, provide indirect benefits to local services throughout the life of the Project (e.g. indirect employment creation in local and regional economies would include jobs supported through transportation, trade supplies, services, accommodation, catering, retail services, etc.), deliver additional income to host and other associated landowners, and provide benefits to the local community through the implementation of the proposed Benefit Sharing Program, planning agreements with local Councils, and annual access fees (related to community and employment purposes) to connect into the CWO REZ transmission line infrastructure.

The assessment findings indicate that while there will be environmental and social impacts associated with the RTS Project, the extent of impact has been minimised through the design process where possible and where impacts are predicted, Tilt Renewables has committed to management, mitigation and offset measures to address these impacts. The assessment findings indicate that while there will be environmental and social impacts associated with the RTS Project, these are generally comparable to the Approved Project.

In conclusion, the Project will provide long-term, strategic benefits to the State of NSW, including:

- Providing a significant boost in renewable energy supply to assist with fulfilling the current obligations under State and Commonwealth renewable energy targets.
- Providing for cleaner reliable electricity generation, assisting with meeting current load demand while reducing greenhouse gas emissions and the impacts of climate change.
- Providing regional investment in the NSW renewable energy sector.
- Making a positive contribution towards achieving the renewable energy target generation from the CWO REZ.

With the implementation of the management, mitigation and offset measures proposed by Tilt Renewables, it is considered that the RTS Project would result in a net benefit to the NSW community.

8.0 References

Australian Energy Market Operator (AEMO) (2019) AEMO Integrated System Plan 2019–20 Assumptions Book as at August 2019.

Australian Energy Market Operator (AEMO) (2022). 2022 Integrated System Plan.

AEMO Services Limited (2023). Draft Tender Information – CWO REZ Access Rights (available at https://aemoservices.com.au).

Aviation Projects Pty Ltd (2023). Aviation Impact Assessment Liverpool Range Wind Farm. Unpublished report prepared for Liverpool Range Wind Farm Pty Ltd. Version 1.4.1 Revised Final, May 2023.

Department of Planning and Environment (DPE) (2022). State Significant Development Guidelines – Preparing an Amendment Report.

Department of Planning, Industry and Environment (DPIE) (2020). Biodiversity Assessment Method 2020.

Energy Corporation of NSW EnergyCo (2023). NSW Network Infrastructure Strategy.

Energy Corporation of NSW (EnergyCo) (2023a) Renewable Energy Zones, https://www.energyco.nsw.gov.au/renewable-energy-zones

NSW Government (2023a) NSW Electricity Strategy, https://www.energy.nsw.gov.au/nsw-plans-and-progress/government-strategies-and-frameworks/nsw-electricity-strategy

NSW Government (2023b) Electricity Infrastructure Roadmap, https://www.energy.nsw.gov.au/nsw-plans-and-progress/major-state-projects/electricity-infrastructure-roadmap

NSW Government (2023c) NSW Transmission Infrastructure Strategy, https://www.energy.nsw.gov.au/nsw-plans-and-progress/government-strategies-and-frameworks/nsw-transmission-infrastructure#:~:text=The%20NSW%20Transmission%20Infrastructure%20Strategy,customers%20to%202040%20and%20beyond

NSW Office of Environment and Heritage (2016). Wind Energy: Noise Assessment Bulletin for State significant wind energy development.

Parkinson, G (2023, June 20) “Not fast enough:” AEMO says renewable pipeline is huge, but stuck at the gates, Renew Economy. https://reneweconomy.com.au/not-fast-enough-aemo-says-renewable-pipeline-is-huge-but-stuck-at-the-gates

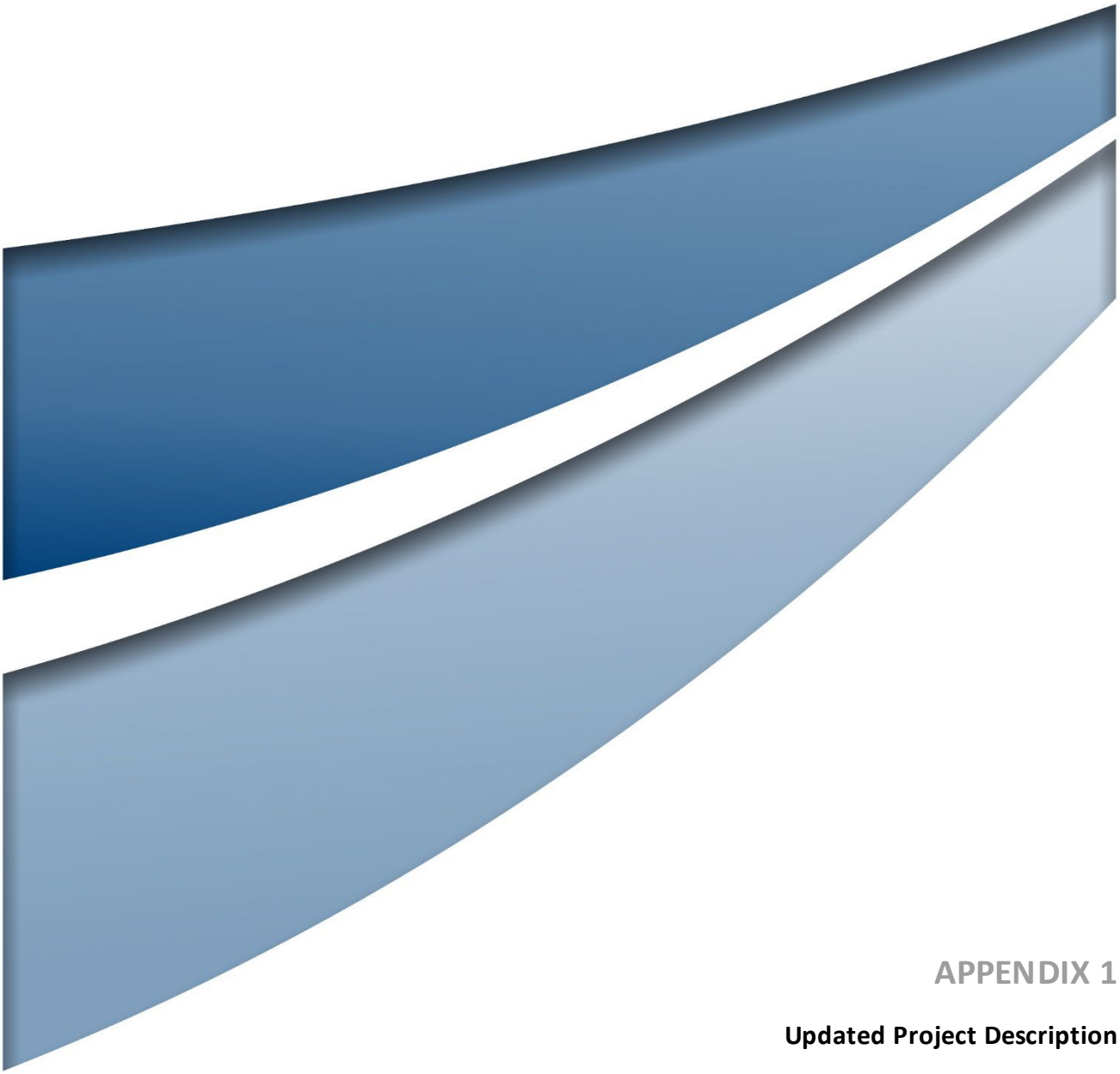
Tilt Renewables (2022). Liverpool Range Wind Farm Modification Assessment Report (Mod-1), Development Consent State Significant Development SSD 6696.

Umwelt (Australia) Pty Limited (2023). Liverpool Range Wind Farm Mod-1 Historic Heritage Assessment. Unpublished report prepared for Liverpool Range Wind Farm Pty Ltd.

Umwelt (Australia) Pty Limited (2023). Biodiversity Development Assessment Report, Liverpool Range Wind Farm. Unpublished report prepared for Liverpool Range Wind Farm Pty Ltd.

WSP (2023). Liverpool Range Wind Farm Shadow Flicker Assessment (Version G). Report prepared for Tilt Renewables on behalf of Liverpool Range Wind Farm Pty Ltd.

WSP (2023). Liverpool Range Wind Farm Electromagnetic Interference Study (Version I). Report prepared for Tilt Renewables on behalf of Liverpool Range Wind Farm Pty Ltd.



APPENDIX 1

Updated Project Description

Liverpool Range Wind Farm - Updated Project Description

A consolidated description of the RTS Project is provided below, in accordance with DPE's SSD Amendment Report Guidelines (DPIE, 2022).

The RTS Project is broadly described as the construction, operation, replacement or upgrade, and decommissioning of a wind farm, including transmission line and ancillary infrastructure, consisting of the following key components:

- **Wind Turbines:** up to 185 wind turbines with a maximum blade tip height of 215 metres, including an adjacent hardstand area for lift cranes and a material laydown;
- **Collector Substations:** up to seven collection substations that step-up the voltage of the reticulation cabling (typically 33 kV) to the transmission line voltage (anticipated to be 330 kV). The collector substations are comprised of multiple components including transformers, circuit breakers, bus bars, and gantries, and are anticipated to occupy a 3D envelope approximately 70 m long x 60 m wide x 9 m high. The steel gantries that support the incoming/outgoing power lines are anticipated to be approximately 25 m high.

  In the event the RTS Project connects into the CWO REZ transmission line the southern collector substation located off Rotherwood Road, Cassilis will convert to a connection substation, and the external transmission line to Ulan and associated connection substation/switchyard at Ulan would no longer be required;
- **Connection Substation (also referred to as Switchyard):** a single 330 kV connection substation located at the southern end of the RTS Project Site Boundary at Ulan, to facilitate connection into the existing Transgrid 330 kV Wellington - Wollar transmission line. Similar to substations, switching stations typically contain bus bars, circuit breakers and steel gantries. The switching station is anticipated to occupy a 3D envelope approximately 150 m long x 100 m wide x 9 m high. Steel gantries that support the power lines are anticipated to be approximately 25 m high.

  In the event the RTS Project connects into the CWO REZ transmission line the external transmission line to Ulan and associated connection substation/switchyard at Ulan would no longer be required;
- **Internal Transmission Line:** overhead powerline of up to 330 kV, supported by poles or towers and located within a 60 m wide easement, that extends from the northwest of the Project site to the southern-most collector substation proposed near Rotherwood Road, Cassilis. The supporting poles are anticipated to be of a steel construction with an indicative height of approximately 30 - 50 m, generally located at intervals of approximately 300 m wherever practicable. Steel towers may need to be used, particularly in complex terrain, as they allow for longer spans and reduced number of supporting structures. Steel poles and towers are anticipated to have an indicative height of approximately 40-50 m;
- **External Transmission Line:** overhead powerline of up to 330 kV, supported by poles or towers and located within a 60 m wide easement, that extends from the southern-most collector substation proposed near Rotherwood Road, Cassilis south to the connection substation proposed at Ulan. The anticipated tower or pole design is as described above for the Internal Transmission Line.

  Approval is also being sought to connect the RTS Project into the CWO REZ transmission line (and remove the external transmission line connection to Ulan) in circumstances where the delivery timeframe for the CWO REZ transmission line aligns with the Liverpool Range Wind Farm project;
- **Reticulation cabling:** underground electrical reticulation cabling, and potentially some overhead powerlines, that provide an electrical connection between the wind turbines and the collector substations. Reticulation cabling is typically rated at 33 kV. Typically underground reticulation cabling is buried in one or more trenches adjacent to access track batters;
- **Access Tracks:** access tracks, typically with a trafficable width of 5.5-6 m, to provide access from the public road network to wind farm and transmission line infrastructure and meteorological masts, and include required cut/fill batters and drainage infrastructure;
- **Site Access Points:** provision of the following site access points off public roads:

- up to 34 site access points from nearby public roads to facilitate construction and ongoing maintenance of the wind farm components located north of the Golden Highway;
- up to 40 site access points from nearby public roads to facilitate construction and ongoing maintenance of the proposed External Transmission Line located south of the Golden Highway;

- **Operation and Maintenance (O&M) Facilities:** up to three O&M facilities incorporating a control room, maintenance and equipment storage facilities. The O&M facility is used to store spare parts and other equipment used for ongoing maintenance of the wind farm, as well as Supervisory Control and Data Acquisition (SCADA) equipment to monitor and control the electrical performance of the wind farm. The O&M facility is anticipated to occupy a 3D envelope approximately 45 m long x 30 m wide x 15 m high;
- **Temporary Construction Compound/Laydown Area/Concrete Batch Plants:** Up to 10 temporary construction facilities, including temporary concrete batching plants, rock crushing equipment, temporary laydown facilities, and construction compounds, of which nine are located within the Wind Farm Site and one located off Cliffdale Road, Turill within the External Transmission Line Site Boundary;
- **Public Road Upgrades/Repairs:** upgrades/repairs to Local and Regional public roads, intersections and associated structures, in proximity to the RTS Project required for the delivery, installation and maintenance of wind turbines, transmission lines, and related infrastructure, in accordance with upgrade/repair standards as agreed with relevant roads authorities;
- **Permanent Wind Monitoring Masts (Met Masts):** up to 10 permanent Power Curve Validation (PCV) met masts to the final hub height, and associated access tracks;
- **Temporary Site Calibration Met Masts:** up to 10 temporary site calibration met masts to the final hub height, to be located at a subset of the turbine locations and removed prior to erection of each relevant turbine; and
- **Subdivision of Land:** subdivision of land within the RTS Project Site Boundary to create new separate lots for the connection and collector substations, and associated ancillary facilities.

Further detailed information supporting this Updated Project Description is provided in Table 1 below, in accordance with DPE's Amendment Report Guidelines.

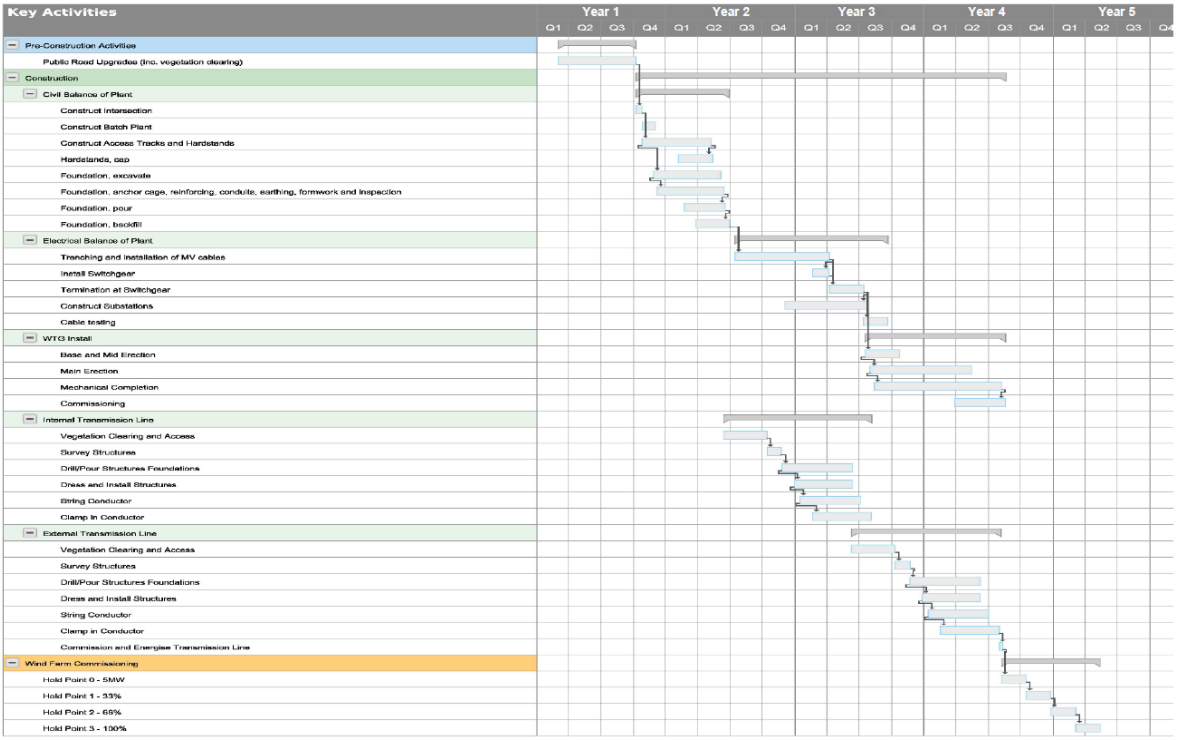
Table 1: RTS Project Description Key Aspects

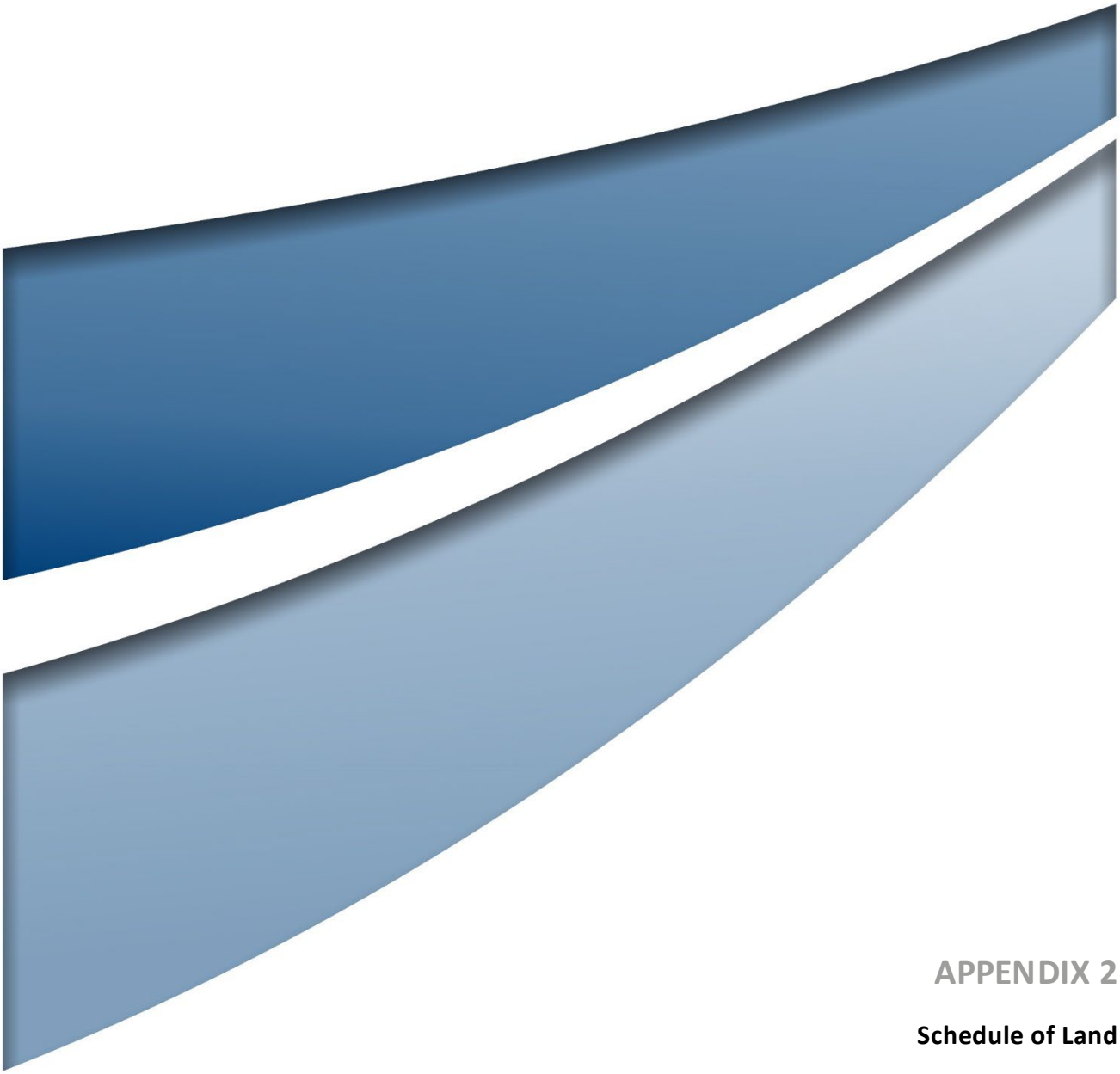
Key Aspects	Description	Section of this Report, Original EIS or Mod-1 Assessment Report
Project area	The land on which the project will be located, including any land required as a buffer area	A brief description of the land on which the RTS Project is located is provided in Section 3.2.3 of the Mod-1 Assessment Report A list of all the lots that form part of the RTS Project is provided in Appendix 2 of this report.
	The land that will be physically disturbed within the project area, and any changes to this disturbance area over time	A comparative summary of the disturbance areas is provided in Section 3.0 of this report. All disturbance areas estimated for the RTS Project include both temporary and permanent ground disturbance and vegetation/habitat clearing. No further expansion of disturbance areas is expected over time. Areas subject to temporary ground disturbance (e.g. cut/fill batters) will be rehabilitated over time.
	The land within the project area with environmental constraints (e.g. high conservation value, subject to	All environmental constraints are summarised in Section 6.0 of this report with further detailed

	flooding) where no development will occur, or development will be minimised	provided in the detailed environmental impact assessments contained in Appendices 6-15.
	Maps / plans showing the project area, disturbance area and any constraints in plan-view and cross section	Overview maps are provided in Figure 3.1 and Figure 3.2 of this report. Maps showing environmental constraints are provided in the detailed environmental impact assessments contained in Appendices 6-15.
Physical layout and design	The layout of all the physical elements of the project within the project area, including all buildings, structures, works, landscaping, open space and biodiversity offsets (if applicable)	An overview of all physical elements are shown in Figure 3.1 and Figure 3.2 of this report.
	All mitigation measures that will be built into the physical layout and design of the project (such as noise walls)	Mitigation measures as they relate to each environmental aspect are detailed in Section 6.0 of this report, wherever relevant, and Appendix 5.
	Any ancillary infrastructure for which approval is being sought (such as upgrades to utilities or surrounding roads)	All ancillary infrastructure for which approval is sought is detailed in Section 3.0 of this report.
	The design of the various physical elements of the project, including the form, materials and finishes	Section 3.3 of the Original EIS provides a summary of the key infrastructure of the Projectsuch as turbine, towers, blades, and nacelles, which, for the main part, continue to generally apply to the RTS Project. Section 3.0 of this Amendment Report provides updated design assumptions for turbines, wind farm infrastructure (e.g. access tracks, substations, operations and maintenance facilities) and transmission line infrastructure (e.g. access tracks, towers/poles, string pads), respectively, that specifically apply to the RTS Project.
	Identify those components of the physical layout and design that may change during the detailed design of the project, and set clear limits within which this change may occur without requiring amendments to the DA or modifications to the development consent if the project is approved	Access track alignments, turbine locations, and locations for O&M facilities, concrete batch plants/construction compounds/laydown areas may be subject to minor changes through the detailed design process This is described further in Section 3.0. Any changes to the number and location of wind farm and transmission line infrastructure will be undertaken within the RTS Project Development Corridor and in accordance with limits and requirements specified in the Development Consent.
	Plans showing the layout and design in plan-view and cross section	Overview maps are provided in Figure 3.1 and Figure 3.2 of this report.
Uses and activities	The land uses e.g. (residential, commercial, mixed use, mining, waste, warehouses, schools, hospitals, intensive agriculture) that characterise the project	The proposed land use is a wind farm with transmission line and connection infrastructure, and ancillary infrastructure, consistent with the Approved Project.
	The activities (e.g. demolition, cut and fill, resource extraction, processing, storage and handling of materials,	The key construction and operational activities are summarised in Section 3.10 of the EIS for the Approved Project, which continues to generally apply to the RTS Project.

	waste disposal, parking) that will be carried out on site	
	The scale and intensity of these activities (e.g. extraction rates, rates of production, hours of operation)	Despite a reduction in the maximum number of turbines, the scale and intensity of construction activities are expected to be generally consistent with the Approved Project.
	the transport of materials and people to and from the site (e.g. raw materials, equipment, products, waste, employees)	Transport of materials and labour to/from the site is summarised in Section 6.6 and Appendix 11 of this Report.
	Process flow diagrams of these uses and activities.	A general process flow diagram is provided below in Figure 1.
Timing Stages	The description should include each stage of the project if the delivery of the project is to be staged.	It is intended that the RTS Project is delivered as a single stage, however this will be confirmed once a balance of plant (BOP) construction contractor has been selected and detailed design progresses.
Timing Phases	The description should include each phase (e.g. demolition, construction, operation, decommissioning and rehabilitation) of the project. However, if the delivery of the project is to be staged, then describe the phases of each stage	It is intended that the RTS Project is delivered as a single stage, however this will be confirmed once a BOP construction contractor has been selected and detailed design progresses.
Timing Sequencing	The description should include the order in which the stages and phases of the project will be carried out and identify snapshots of the project at key points in time that will be used to assess the impacts of the project (see discussion below). This description should be supported by a simple graphic showing the planned sequencing of the project, and concurrent delivery of the various stages and phases of the project.	It is intended that the RTS Project is delivered as a single stage, however this will be confirmed once a BOP construction contractor has been selected and detailed design progresses.

Figure 1: Indicative construction flow diagram – to be confirmed once a BOP contractor has been engaged (due late 2023)





APPENDIX 2

Schedule of Land

Appendix 1 – Schedule of Land

No.	Association	Lot/Plan
1	Wind Farm	1/1045523
2	Wind Farm	1/1090231
3	Wind Farm	1/1096238
4	Wind Farm	1/1097739
5	Wind Farm	1/1102992
6	Wind Farm	1/1107124
7	Wind Farm	1/1113702
8	Wind Farm	1/1121270
9	Wind Farm	1/112903
10	Wind Farm	1/1178469
11	Wind Farm	1/1233086
12	Wind Farm	1/1233328
13	Wind Farm	1/1236497
14	Wind Farm	1/131751
15	Wind Farm	1/131752
16	Wind Farm	1/131761
17	Wind Farm	1/131788
18	Wind Farm	1/223581
19	Wind Farm	1/249619
20	Wind Farm	1/258902
21	Wind Farm	1/363098
22	Wind Farm	1/363099
23	Wind Farm	1/363100
24	Wind Farm	1/397042
25	Wind Farm	1/397043
26	Wind Farm	1/397493
27	Wind Farm	1/397494
28	Wind Farm	1/397495
29	Wind Farm	1/522745
30	Wind Farm	1/580750
31	Wind Farm	1/614827
32	Wind Farm	1/614906
33	Wind Farm	1/651613
34	Wind Farm	1/659801
35	Wind Farm	1/706361
36	Wind Farm	1/747190
37	Wind Farm	1/754969
38	Wind Farm	1/798400
39	Wind Farm	1/843798
40	Wind Farm	1/847023
41	Wind Farm	1/864461
42	Wind Farm	1/879624
43	Wind Farm	1/981960

No.	Association	Lot/Plan
44	Wind Farm	10/1073728
45	Wind Farm	10/223584
46	Wind Farm	10/42211
47	Wind Farm	10/750741
48	Wind Farm	10/750775
49	Wind Farm	10/754969
50	Wind Farm	100/750738
51	Wind Farm	100/750763
52	Wind Farm	101/750738
53	Wind Farm	101/750763
54	Wind Farm	102/186048
55	Wind Farm	102/750744
56	Wind Farm	102/750763
57	Wind Farm	103/750738
58	Wind Farm	103/750744
59	Wind Farm	103/750763
60	Wind Farm	104/750738
61	Wind Farm	104/750744
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63	Wind Farm	105/750763
64	Wind Farm	106/750738
65	Wind Farm	106/750744
66	Wind Farm	106/750763
67	Wind Farm	107/661247
68	Wind Farm	108/750738
69	Wind Farm	108/750744
70	Wind Farm	108/750775
71	Wind Farm	109/750744
72	Wind Farm	109/750763
73	Wind Farm	11/1073728
74	Wind Farm	11/223584
75	Wind Farm	11/42211
76	Wind Farm	11/750741
77	Wind Farm	11/750775
78	Wind Farm	11/754969
79	Wind Farm	110/750744
80	Wind Farm	110/750775
81	Wind Farm	112/1083285
82	Wind Farm	113/750744
83	Wind Farm	114/750744
84	Wind Farm	114/750763
85	Wind Farm	115/41493
86	Wind Farm	115/750744

No.	Association	Lot/Plan
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100	Wind Farm	12/750741
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130	Wind Farm	139/750763
131	Wind Farm	14/1073728

No.	Association	Lot/Plan
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134	Wind Farm	14/750775
135	Wind Farm	14/754969
136	Wind Farm	140/750763
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153	Wind Farm	16/223584
154	Wind Farm	16/750738
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164	Wind Farm	166/750763
165	Wind Farm	167/750738
166	Wind Farm	167/750763
167	Wind Farm	168/750738
168	Wind Farm	168/750763
169	Wind Farm	169/750744
170	Wind Farm	17/223584
171	Wind Farm	170/750744
172	Wind Farm	171/750738
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174	Wind Farm	172/750744
175	Wind Farm	173/750738
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187	Wind Farm	2/1096238
188	Wind Farm	2/1102992
189	Wind Farm	2/1107124
190	Wind Farm	2/1113702
191	Wind Farm	2/112903
192	Wind Farm	2/131761
193	Wind Farm	2/131788
194	Wind Farm	2/232010
195	Wind Farm	2/242557
196	Wind Farm	2/249619
197	Wind Farm	2/258902
198	Wind Farm	2/502632
199	Wind Farm	2/519117
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201	Wind Farm	2/531707
202	Wind Farm	2/580750
203	Wind Farm	2/614827
204	Wind Farm	2/747190
205	Wind Farm	2/750763
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207	Wind Farm	2/843798
208	Wind Farm	2/864461
209	Wind Farm	20/223589
210	Wind Farm	20/750775
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212	Wind Farm	21/223589
213	Wind Farm	21/750775
214	Wind Farm	21/998524
215	Wind Farm	22/223589
216	Wind Farm	22/750738
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219	Wind Farm	220/750763
220	Wind Farm	226/750763
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259	Wind Farm	27/750738
260	Wind Farm	27/750741
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262	Wind Farm	27/750763
263	Wind Farm	28/511950
264	Wind Farm	28/750738
265	Wind Farm	28/750741
266	Wind Farm	29/226028

No.	Association	Lot/Plan
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268	Wind Farm	29/750741
269	Wind Farm	3/1090231
270	Wind Farm	3/131761
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309	Wind Farm	4/883170
310	Wind Farm	40/750738
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No.	Association	Lot/Plan
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No.	Association	Lot/Plan
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370	Wind Farm	61/750744
371	Wind Farm	62/750738
372	Wind Farm	62/750763
373	Wind Farm	63/750738
374	Wind Farm	63/750763
375	Wind Farm	64/750738
376	Wind Farm	65/750741
377	Wind Farm	66/750738
378	Wind Farm	66/750741
379	Wind Farm	67/750738
380	Wind Farm	67/750741
381	Wind Farm	68/750738
382	Wind Farm	69/750738
383	Wind Farm	69/750775
384	Wind Farm	7/132085
385	Wind Farm	7/223584
386	Wind Farm	7/42211
387	Wind Farm	7/750741
388	Wind Farm	7/754969
389	Wind Farm	70/750775
390	Wind Farm	7001/1030462
391	Wind Farm	7002/96915
392	Wind Farm	7003/96916
393	Wind Farm	71/750741
394	Wind Farm	71/750775
395	Wind Farm	72/750738
396	Wind Farm	72/750775
397	Wind Farm	73/750738
398	Wind Farm	73/750775
399	Wind Farm	7362/1179208
400	Wind Farm	74/750738
401	Wind Farm	74/750763

No.	Association	Lot/Plan
402	Wind Farm	74/750775
403	Wind Farm	75/750738
404	Wind Farm	75/750763
405	Wind Farm	76/750738
406	Wind Farm	76/750763
407	Wind Farm	77/750763
408	Wind Farm	78/750738
409	Wind Farm	79/750738
410	Wind Farm	79/750763
411	Wind Farm	8/132085
412	Wind Farm	8/223584
413	Wind Farm	8/42211
414	Wind Farm	8/750741
415	Wind Farm	8/754969
416	Wind Farm	80/750738
417	Wind Farm	80/750763
418	Wind Farm	81/750738
419	Wind Farm	82/750775
420	Wind Farm	83/750775
421	Wind Farm	84/750738
422	Wind Farm	85/750738
423	Wind Farm	85/750775
424	Wind Farm	86/750738
425	Wind Farm	87/750738
426	Wind Farm	88/750738
427	Wind Farm	89/750738
428	Wind Farm	89/750749
429	Wind Farm	9/132085
430	Wind Farm	9/223584
431	Wind Farm	9/42211
432	Wind Farm	9/750775
433	Wind Farm	9/754969
434	Wind Farm	90/750738
435	Wind Farm	91/750738
436	Wind Farm	91/750775
437	Wind Farm	92/750738
438	Wind Farm	92/750763
439	Wind Farm	93/750738
440	Wind Farm	93/750763
441	Wind Farm	94/750738
442	Wind Farm	94/750763
443	Wind Farm	95/750738
444	Wind Farm	96/750738
445	Wind Farm	96/750763
446	Wind Farm	96/750775

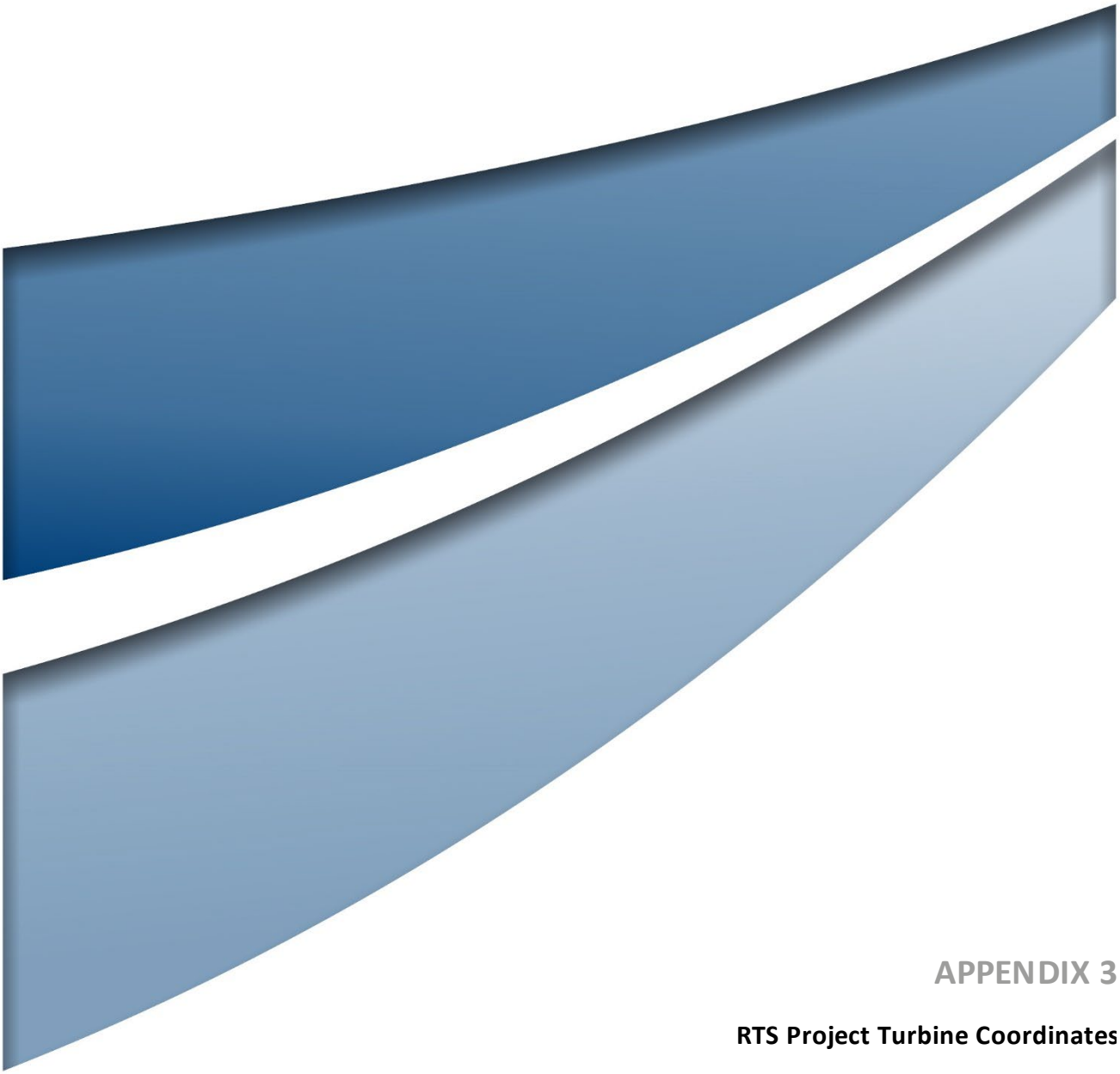
No.	Association	Lot/Plan
447	Wind Farm	97/750738
448	Wind Farm	97/750749
449	Wind Farm	97/750763
450	Wind Farm	98/750738
451	Wind Farm	98/750763
452	Wind Farm	A/418915
453	Wind Farm	B/418915
454	Transmission Line	1/1228299
455	Transmission Line	1/1289109
456	Transmission Line	1/191806
457	Transmission Line	1/431692
458	Transmission Line	100/750748
459	Transmission Line	11/734934
460	Transmission Line	12/734934
461	Transmission Line	127/750771
462	Transmission Line	13/256129
463	Transmission Line	136/750748
464	Transmission Line	139/750748
465	Transmission Line	14/114309
466	Transmission Line	161/750748
467	Transmission Line	18/750748
468	Transmission Line	2/1289109
469	Transmission Line	3/1081382
470	Transmission Line	3/1214133
471	Transmission Line	33/755439
472	Transmission Line	4/1081382
473	Transmission Line	4/1214133
474	Transmission Line	4/254128
475	Transmission Line	43/736630
476	Transmission Line	5/1246858
477	Transmission Line	5/256129
478	Transmission Line	52/750748
479	Transmission Line	53/750748
480	Transmission Line	55/722794
481	Transmission Line	6/254128
482	Transmission Line	61/750736
483	Transmission Line	62/750769 (see Note 1)
484	Transmission Line	63/750769
485	Transmission Line	69/750771
486	Transmission Line	7008/1026534
487	Transmission Line	7008/1128119
488	Transmission Line	7009/1128119
489	Transmission Line	72/750736
490	Transmission Line	73/750736

No.	Association	Lot/Plan
491	Transmission Line	73/750771
492	Transmission Line	7300/1136299
493	Transmission Line	7303/1143562
494	Transmission Line	751/1270886
495	Transmission Line	8/114309
496	Transmission Line	82/750736
497	Transmission Line	94/750769
498	Transmission Line	96/750769
499	Transmission Line	Unidentified lot
500	Transmission Line	Unidentified lot
501	Public Road Upgrade	1/1174319
502	Public Road Upgrade	1/1285988
503	Public Road Upgrade	1/132982
504	Public Road Upgrade	1/241006
505	Public Road Upgrade	1/34949
506	Public Road Upgrade	1/617544
507	Public Road Upgrade	1/653132
508	Public Road Upgrade	1/91165
509	Public Road Upgrade	109/750738
510	Public Road Upgrade	11/256129
511	Public Road Upgrade	110/750738
512	Public Road Upgrade	111/750738
513	Public Road Upgrade	113/750738
514	Public Road Upgrade	114/750738
515	Public Road Upgrade	115/750738
516	Public Road Upgrade	116/750738
517	Public Road Upgrade	12/750738
518	Public Road Upgrade	122/750738
519	Public Road Upgrade	123/750738
520	Public Road Upgrade	124/750738
521	Public Road Upgrade	125/750738
522	Public Road Upgrade	131/750744
523	Public Road Upgrade	132/750744
524	Public Road Upgrade	133/750744
525	Public Road Upgrade	134/750738
526	Public Road Upgrade	135/750738
527	Public Road Upgrade	141/750744
528	Public Road Upgrade	143/750744
529	Public Road Upgrade	162/750771
530	Public Road Upgrade	171/750771
531	Public Road Upgrade	174/722912
532	Public Road Upgrade	174/750738
533	Public Road Upgrade	175/46130
534	Public Road Upgrade	176/46130
535	Public Road Upgrade	176/722913

No.	Association	Lot/Plan
536	Public Road Upgrade	177/46130
537	Public Road Upgrade	178/46130
538	Public Road Upgrade	179/722914
539	Public Road Upgrade	180/820795
540	Public Road Upgrade	181/820795
541	Public Road Upgrade	181/822500
542	Public Road Upgrade	19/256129
543	Public Road Upgrade	2/1060972
544	Public Road Upgrade	2/1124819
545	Public Road Upgrade	2/1285988
546	Public Road Upgrade	2/131752
547	Public Road Upgrade	2/241006
548	Public Road Upgrade	2/727227
549	Public Road Upgrade	200/750744
550	Public Road Upgrade	21/1157809
551	Public Road Upgrade	22/1157809
552	Public Road Upgrade	3/47510
553	Public Road Upgrade	302/792878
554	Public Road Upgrade	304/722890
555	Public Road Upgrade	43/750744
556	Public Road Upgrade	45/750744
557	Public Road Upgrade	6/750748
558	Public Road Upgrade	7001/1066300
559	Public Road Upgrade	7001/96905
560	Public Road Upgrade	7002/1066300
561	Public Road Upgrade	7002/1066303

No.	Association	Lot/Plan
562	Public Road Upgrade	7003/1117434
563	Public Road Upgrade	7003/96959
564	Public Road Upgrade	7004/96959
565	Public Road Upgrade	7005/1066303
566	Public Road Upgrade	7009/1066302
567	Public Road Upgrade	7300/1138893
568	Public Road Upgrade	7301/1133296
569	Public Road Upgrade	7309/1138836
570	Public Road Upgrade	77/750744
571	Public Road Upgrade	84/750749
572	Public Road Upgrade	86/750748
573	Public Road Upgrade	98/46086
574	Public Road Upgrade	99/46086
575	OSOM Haulage Route	100/1118411
576	OSOM Haulage Route	101/1161684
577	OSOM Haulage Route	11/1160725
578	OSOM Haulage Route	2/1131052
579	OSOM Haulage Route	2/1160725
580	OSOM Haulage Route	20/1085485
581	OSOM Haulage Route	290/1141655
582	OSOM Haulage Route	332/1176879
583	OSOM Haulage Route	5/758542
584	OSOM Haulage Route	51/1134671
585	OSOM Haulage Route	7/1244305
586	OSOM Haulage Route	700/1255118

Note 1: No land agreement is currently in place with the landowner of this lot



APPENDIX 3

RTS Project Turbine Coordinates

Appendix 3 – RTS Project Turbine Coordinates

Turbine ID	Easting	Northing
A01	764360.7	6485938
A02	764566.8	6486348
A03	764737.4	6486841
A04	765656.7	6486573
A05	766042.9	6486932
A06	766305.2	6487294
A10	768522	6489885
A14	769778.7	6490193
A15	769806.1	6490773
A16	769841.5	6491205
A17	770656.8	6490699
A18	770735.7	6490142
B01	767578.5	6482849
B02	767769.7	6483761
B03	767877	6483242
B04	767974.6	6484271
B05	768299.1	6484683
B06	768637.6	6485368
B07	768977.1	6485759
B08	769063.2	6486277
B09	769439.7	6486643
B10	771045.1	6485766
B11	771282.5	6487693
B13	771954.9	6488052
B14	772082.3	6486065
B16	772225.1	6486575
B18	772386.2	6488340
B19	772575.2	6486982
B20	772763.1	6488774
B21	772792.6	6489755
B24	773205.9	6487152
B25	773412.4	6489030
B26	773426.8	6488066
B27	773499.2	6489633
C01	776481	6486764
C02	776559.5	6487941
C03	776772	6485421
C04	777120.8	6488572
C05	777296.6	6485744
C06	777334.8	6487108
C07	777395.1	6489020

Turbine ID	Easting	Northing
C08	777554.1	6486309
C09	777667.3	6487543
C11	778417.3	6487559
C12	778539.1	6486068
C13	778573.4	6485445
C14	779475.1	6488638
C15	779541.1	6487124
C16	779588.3	6485990
C17	779674.1	6487677
C18	779864	6486437
D01	763794.6	6473432
D02	764026.2	6473963
D03	764216.8	6474467
D04	764399.7	6474954
D05	764809.6	6476905
D06	764885.1	6475416
D07	765139.9	6475867
D08	765447.1	6476443
D09	765682.1	6474644
D10	765851.3	6475212
D11	766123.3	6475736
D12	766245.8	6476249
D13	766275.7	6477421
D14	766940.6	6475782
D15	767048.4	6477144
D16	767234.4	6478105
D17	767250.6	6472606
D18	767257.7	6475258
D19	767282.1	6473182
D20	767373.4	6477563
D21	767370.9	6473700
D22	767458.2	6474215
D23	767599.8	6474797
D24	767886.8	6477940
D25	767979	6478454
D26	769097.1	6478643
D27	769937.3	6478420
D28	770260.3	6475109
D29	770321.7	6475638
D30	770415.9	6476612
D31	770420.1	6478652

Turbine ID	Easting	Northing
D32	770951.7	6476714
D33	771013.7	6478364
D34	771142.3	6477198
D35	771149.4	6477851
D36	771479.8	6475501
D37	771784.4	6475940
D38	771774.5	6478808
D39	771812.7	6476947
D40	772031.2	6479483
D41	771987.1	6476442
D42	772383.1	6480376
D43	772898.1	6479197
D44	772920.4	6478596
D45	773029.6	6480314
D46	773445.2	6480651
D47	773848.9	6480999
D48	774403.6	6481119
D49	774609.2	6480574
D50	774845	6481663
D51	775337.8	6481846
D52	775461.3	6482422
D53	775743.8	6482920
D54	776508.7	6482765
D55	776834.8	6483266
D57	778113.2	6483831
D58	779577	6483903
D59	779760.6	6484456
E01	771416.8	6470034
E02	771655.4	6470550
E03	771973.8	6470943
E04	772291.3	6471337
E05	772772.9	6470419
E06	772784.3	6471841
E07	773012	6471045
E08	773091.3	6472425
E09	773365.9	6471447
E10	773955.6	6472379
E11	774330.4	6472873
E12	774332.1	6473498
E13	774702.8	6474188
E14	774745.4	6467673
E15	774811	6474695
E16	774919.3	6468177
E17	775216.5	6475018
E18	775544.1	6470908

Turbine ID	Easting	Northing
E19	775734.1	6471797
E20	776074.4	6473020
E21	776145.2	6473541
E22	776153.3	6472322
E23	776175.8	6476263
E24	776439.7	6476721
E25	776508.8	6474452
E26	776528.5	6473904
E28	776767.3	6477771
E29	776786.6	6480639
E31	776882.7	6478314
E32	776872.9	6481153
E33	777149.3	6475421
E34	777201.8	6478905
E35	777324.4	6481410
E36	777382.1	6479441
E37	777428.8	6475883
E38	777662.4	6476370
E39	777771	6476893
E40	778007	6477395
E43	778767.7	6479174
E44	779184.5	6479530
E45	779295.6	6481899
E46	779488.5	6480007
E47	779933	6480695
E48	779873.9	6481838
E50	780393.6	6481909
E51	780733.6	6482300
F01	776890	6458475
F02	777082.1	6459907
F03	777300.5	6460379
F04	777517	6460853
F05	777720.6	6461338
F06	777833.6	6459190
F07	777907.6	6462294
F08	778377.8	6458658
F09	779661.6	6463197
F10	780000.6	6463590
F11	780236.3	6460778
F12	780354.6	6467150
F13	780373.4	6460279
F14	780499.6	6462103
F15	780509.9	6461229
F16	780618.6	6467599
F17	780622.6	6462625

Turbine ID	Easting	Northing
F20	780939.6	6463036
F21	780950.8	6468488
F22	781044	6463546
F24	781449.7	6463905
F25	781464	6468579
F26	781521	6469143
F28	781996.4	6469360

Turbine ID	Easting	Northing
F30	782186.8	6461499
F31	782572.6	6461823
F32	782652.8	6462321
F33	782987.9	6462704
F34	783238.1	6463141
F35	783496.8	6463476