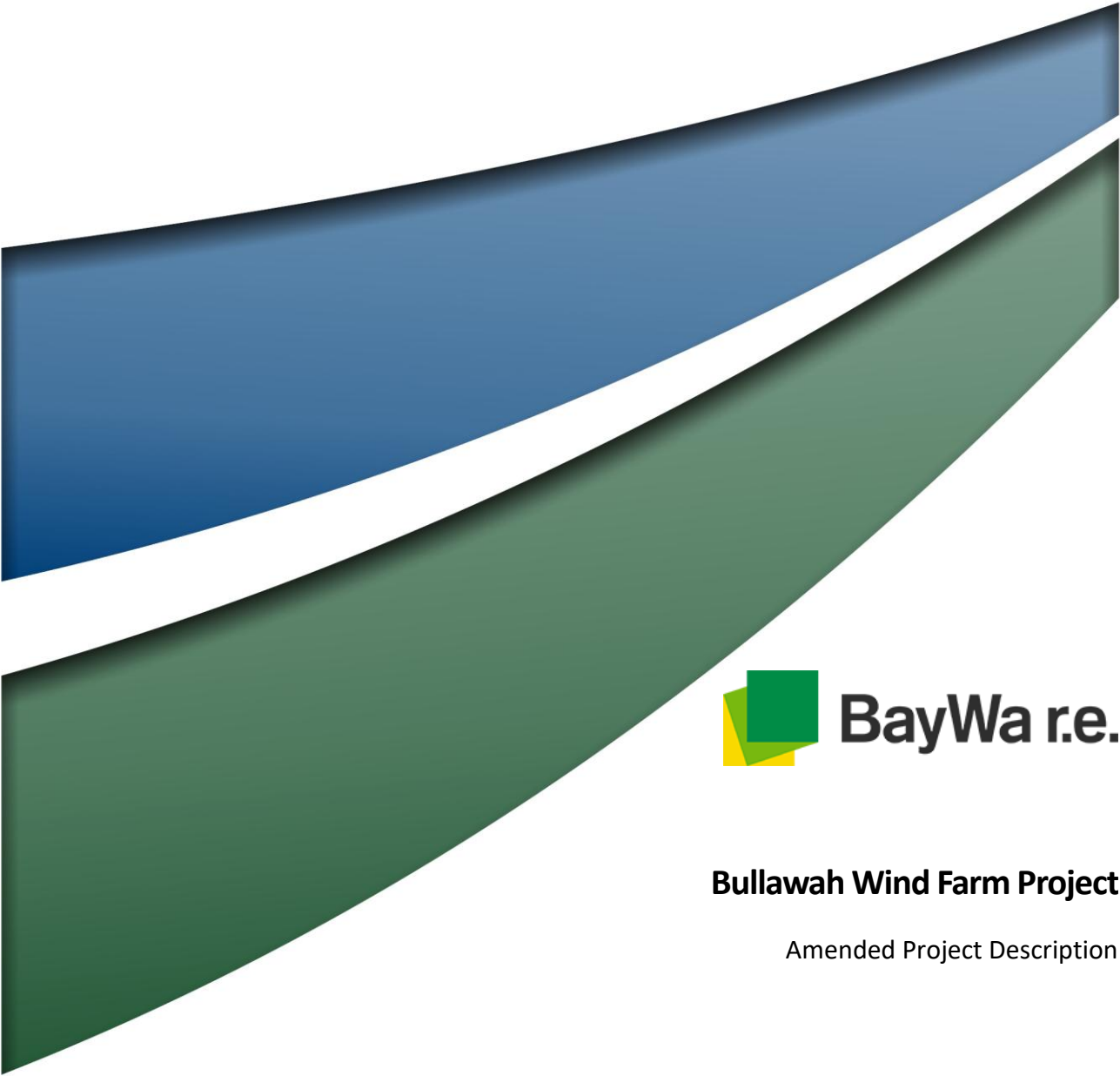




r.e. think energy

Appendix F: Amended Project Description



Bullawah Wind Farm Project

Amended Project Description

Final

August 2025



BULLAWAH WIND FARM PROJECT

Amended Project Description

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Bullawah Wind Farm Pty Ltd

Project Director: **Nathan Baker**
Project Manager: **Thomas Buchan**
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Report No. **22110/R41A**
Date: **August 2025**



This report was prepared using
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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.

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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
Final	Lauren Evans	20 March 2025	Nathan Baker	21 March 2025
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1.0 Amended Project Description

This project description has been amended following the public exhibition of the Environmental Impact Statement (EIS) in August/September 2024. Amendments to the project description are presented in red text.

Features of the Project have been updated in response to NSW government agency advice received on the Amended Project, included updates to the projects Local Transport Route proposed in **Section 1.3.9.3**, as part of a response to a formal request for information (RFI) raised by NSW Department of Planning, Housing and Infrastructure (DPHI) on 23 June 2025 (i.e. RFI#2). Updates to this project description in response to RFI#2 are made in blue text. This updated project description is included as Appendix E of Response to RFI#2 (Umwelt, 2025).

1.1 Project Overview

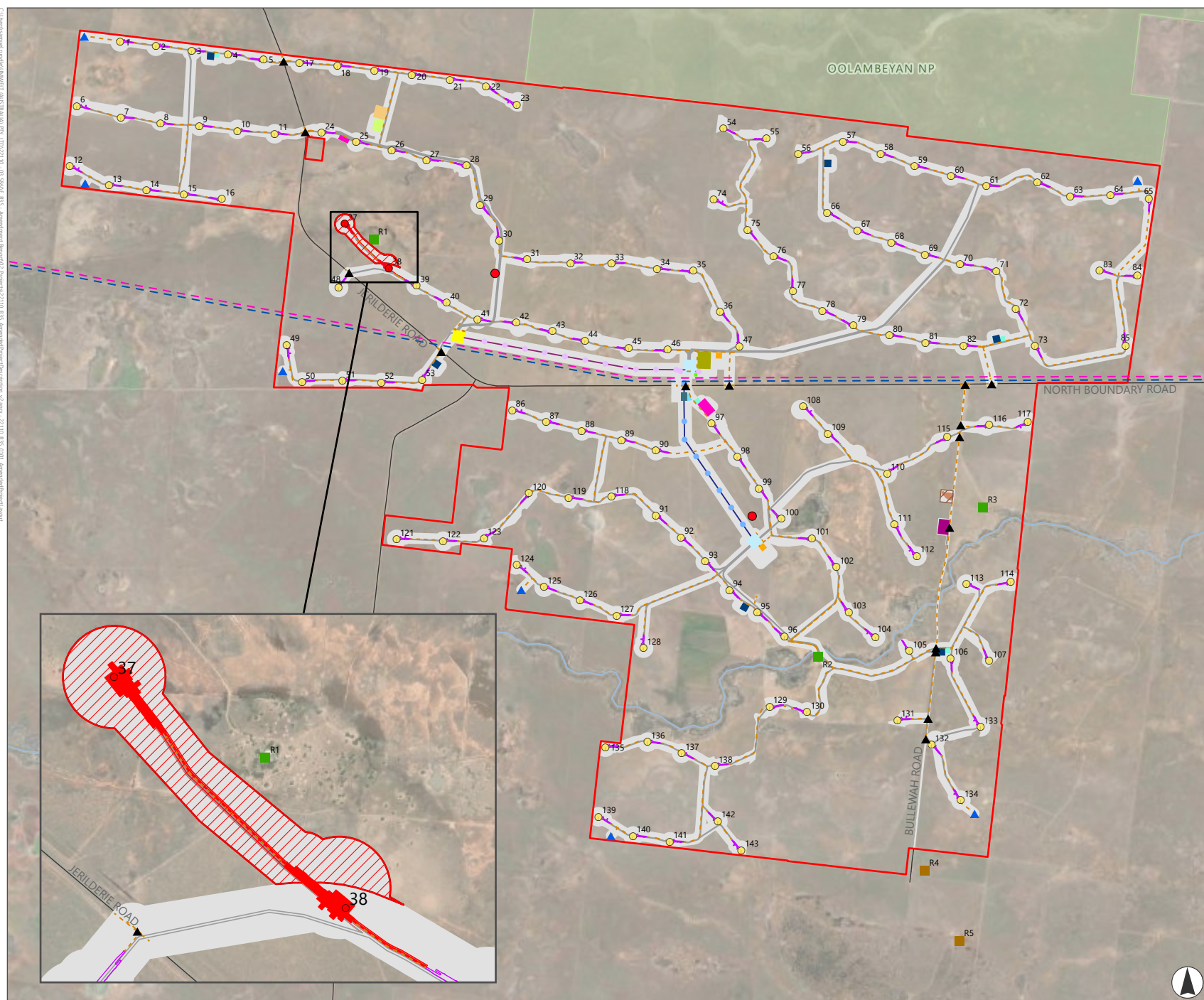
The Bullawah Wind Farm Project (i.e. the Project) has been designed and refined through a comprehensive process that incorporates community and other stakeholder feedback to maximise positive social, economic and environmental outcomes while minimising environmental and social impacts.

The key components of the Project include:

- Up to **141** (three (3) blade) wind turbine generators (WTGs), with a maximum blade-tip height of 300 metres (m) above ground.
- A 359 MW / 718 MWh battery energy storage facility.
- Permanent ancillary infrastructure including internal roads, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks.
- Temporary facilities, including a temporary workers accommodation (TWA) camp, site offices, amenities, construction compounds and laydown areas, on-site borrow pits, rock crushing facilities, concrete or asphalt batching plants, minor 'work front' construction access roads, environmental management and monitoring and signage.
- Off-site road works, involving upgrades to the proposed local transport route and establishment of site access points to facilitate delivery of wind turbine components to the Project Area as required.

The indicative **Amended** Project layout is shown on **Figure 1.1**. Key components of the Project are summarised in **Table 1.1** and are described in further detail in the sections below.

FIGURE 1.1
Amended Project Layout



- Legend**
- Project Boundary
 - Development Corridor
 - Wind Turbine Generators
 - Host Residence
 - Associated Residence (Visual Impact)
 - 220kV Transmission Poles
 - 330kV Transmission Poles
 - Site Access Points
 - Permanent Meteorological Masts
 - Temporary Met Mast (As Built)
 - Tracks Connecting Hardstands
 - Hardstand Area
 - Cable Corridor
 - 330kV Project Energy Connect Line
 - 220kV External Transmission Line
 - 330kV Internal Transmission Line (North to Central)
 - 220kV Internal Transmission Line (Central to South)
 - Main Temporary Laydown
 - Temporary Satellite Laydown
 - Main Temporary Construction Compound
 - Temporary Construction Compound
 - Temporary Workers Accommodation Compound
 - Operations and Maintenance Facility
 - Collector Substation
 - 220 kV Switchyard
 - Switchyard Laydown Area
 - Main Substation
 - Main Substation Temporary Laydown
 - Battery Storage
 - Quarry South (Current)
 - Quarry South (Proposed)
 - Quarry North
 - NPWS Reserves
 - Road
- To Be Removed**
- Wind Turbine Generators
 - Development Corridor
 - Disturbance Footprint



Kilometres
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Table 1.1 Project Overview

Project Element	EIS Project (As Exhibited)	Amended Project	Relevant Figure
Life of Project	30 years	No change	Not applicable
Project Area	Approximately 20,629 hectares (ha)	No change	Figure 1.1
Development Corridor	Approximately 4,311 ha	Approximately 4,274 ha	Figure 1.1
Disturbance Footprint	<p>Approximately 661 ha, comprising:</p> <ul style="list-style-type: none"> ~642 ha of disturbance wholly contained within the Project’s Development Corridor, to facilitate the construction of WTGs, ancillary infrastructure and temporary facilities ~19 ha of disturbance associated with off-site road works on the Project’s Local Transport Route. 	<p>Approximately 656.5 ha, comprising:</p> <ul style="list-style-type: none"> ~637 ha of disturbance wholly contained within the Project’s Development Corridor, to facilitate the construction of WTGs, ancillary infrastructure and temporary facilities ~19 ha of disturbance associated with off-site road works on the Project’s Local Transport Route ~0.5 ha of disturbance associated with off-site road works on the Project’s Port to Hay Transport Routes. <p><i>The area of offsite disturbance has been considered throughout the Amended Project but is described and quantified separate to the Disturbance Footprint to support the Amended Biodiversity Development Assessment Report (BDAR) (Umwelt, 2025) that by necessity incorporates both linear and site based assessment methods for Stage 1, and then a linear assessment for Stage 2.</i></p>	Figure 1.2
Generating Capacity	Up to 815.1 MW	Up to 803.7 MW	Not applicable
WTGs	Up to 143 (three (3) blade) WTGs	Up to 141 (three (3) blade) WTGs	Figure 1.1
Battery Storage	359 MW, 718 MWh (two-hour) battery	No change	Figure 1.1
Ancillary Infrastructure	<p>Ancillary infrastructure for the Project includes, but is not limited to:</p> <ul style="list-style-type: none"> internal roads (also shown as ‘tracks connecting hardstands’ on figures) hardstands 	No change	Figure 1.1

Project Element	EIS Project (As Exhibited)	Amended Project	Relevant Figure
	<ul style="list-style-type: none"> • main and collector substations • switchyards • Operations & Maintenance (O&M) facilities • underground and overhead transmissions lines and poles • telecommunications facilities and utility services • permanent meteorological masts • water storage tanks. 		
Temporary Facilities	Temporary facilities include, but are not limited to: <ul style="list-style-type: none"> • the TWA • construction site compounds, including: <ul style="list-style-type: none"> ○ site office, amenities and parking areas ○ construction laydown areas for equipment and supplies ○ rock crushing facilities and batching plants (concrete and/or asphalt) ○ temporary stockpiling and material storage areas. • laydown areas • on-site borrow pits • minor ‘workfront’ construction roads • environmental management and monitoring • signage. 	No change	Figure 1.1
Subdivision / other	The Project also seeks the option for subdivision and boundary adjustments to occur. These may be required to subdivide lands for the 330 kV main substation connecting into Project EnergyConnect, the 220 kV switchyard connecting into the existing 220 kV transmission line, and/or other subdivisions that may be required following the detailed design of the Project e.g. where physical roads do not follow the road easement.	No change	Figure 1.6

Project Element	EIS Project (As Exhibited)	Amended Project	Relevant Figure
Port to Hay Transport Routes	Two (2) indicative oversized and/or overmass (OSOM) transport routes from the Port of Newcastle were identified within the EIS, as described in the row below. However, no off-site road works were initially proposed as part of the EIS Project on the assumption that these works would be undertaken in accordance with the Memorandum of Understanding (MOU) between EnergyCo and Transport for NSW (TfNSW) for the South West REZ.	<p>Five (5) proposed OSOM transport route options from the Ports of Adelaide and Newcastle have been identified, as described in the rows below. These routes have been assessed within the Amendment Report and associated off-site road works now form part of the Amended Project.</p> <p>The five (5) proposed route options comprise:</p> <ul style="list-style-type: none"> • three (3) transport routes from the Port of Newcastle • two (2) transport routes extending from Port Adelaide. <p>The Project has varying OSOM requirements based on the length and height of the various WTG components, which explains the number of route options presented above. The routes and their intended purposes are described in the 'Port of Newcastle to Hay Routes' and 'Port Adelaide to Hay Routes' rows below.</p>	Figure 1.7
Port of Newcastle to Hay Routes	<ul style="list-style-type: none"> • Route 1: Via NorthConnex (Sydney) – Maximum loaded height of 5.25 m for blades and other components • Route 2: Via Central West – Maximum loaded height of 5.9 m for towers and other high loads 	<ul style="list-style-type: none"> • Route 1: Via NorthConnex (Sydney) – Maximum loaded height of 4.9 m for blades. • Route 2: Via Central West – Maximum loaded height of 6.1 m for towers. • Route 3: Via Pennant Hills Road (Sydney) – Maximum loaded height of 5.3 m for nacelles, generators, drive trains, hubs and smaller components. 	Figure 1.7
Port Adelaide to Hay Routes	Not assessed	<ul style="list-style-type: none"> • Route 1: Via Robinvale - Maximum loaded height of 5.2 m for blades, motors and general loads • Route 2: Via Robinvale - Towers and any load exceeding a maximum loaded height of 5.2 m <p><i>Note: Segments of the Port Adelaide to Hay Routes outside the State of NSW do not form part of the Amended Project. Where the need for off-site road works to facilitate OSOM movements has been identified outside NSW, these works will be subject to separate approval processes under the relevant legislation.</i></p>	Figure 1.7

Project Element	EIS Project (As Exhibited)	Amended Project	Relevant Figure
Port to Hay Off-site Road Works	Not assessed	Discrete areas along the five (5) Port to Hay Transport Routes where road modifications are required to enable the safe transport of Project components using OSOM vehicles. In some instances, these road modifications result in disturbance outside of the road corridor but within the road reserve. These modifications form part of the Amended Project.	Figure 1.8
Local Transport Route	The Local Transport Route extends from the intersection of the Cobb Highway and Jerilderie Road to the Project Area. All traffic movements to and from the Project will utilise this route, with the exception of some quarry material deliveries which may utilise alternative routes. The Project includes road widening and establishment of temporary parking areas at selected locations along the Local Transport Route.	No change	Figure 1.9
Local Transport Route Off-site Road Works	Local transport route off-site road works include: <ul style="list-style-type: none"> Proposed upgrades to the local transport route, including widening of the hardstand at the intersection of Cobb Highway and Jerilderie Road, widening of North Boundary Road and the maintenance and use of roadside parking areas along Jerilderie Road during the construction period. Establishment of 14 site access points, with 13 of these accommodating OSOM movements for incoming WTG components and one (1) providing access to the proposed TWA. Each access will be gated and secured, and appropriate warning signs erected. Ground disturbance, clearing/pruning of vegetation associated with the activities described above. 	No change	Figure 1.9
Proposed Site Access	A total of 14 site access points will be established off Jerilderie Road, North Boundary Road and Bullewah Road, with 13 accommodating OSOM movements for incoming WTG components and one providing access to the proposed TWA off Bullewah Road.	No change	Figure 1.9

Project Element	EIS Project (As Exhibited)	Amended Project	Relevant Figure
Construction Workforce	Peak of approximately 350 FTE positions (estimated average 207 FTE positions over the duration of construction).	Peak of approximately 380 FTE positions (estimated average of approximately 182 FTE positions over the duration of construction).	Not applicable
Operational Workforce	40 FTE positions.	No change	Not applicable
Hours of Operation (Construction and Decommissioning Phases)	Construction and decommissioning activities will occur between 7:00 am to 6:00 pm Monday to Friday, and 8:00 am to 1:00 pm Saturday, except during specific circumstances, as detailed in Section 1.2.4 .	No change	Not applicable
Hours of Operation (Operational Phase)	24 hours, seven (7) days per week.	No change	Not applicable
Construction Timeframe	Approximately 3.5 years, indicatively commencing in Q4 of 2025 and concluding in Q2 of 2029.	Approximately three (3) years, or 35 months, indicatively commencing in Q4 of 2025 and concluding in Q4 of 2028.	Not applicable
Project Staging	The Project would be constructed and commissioned in stages. For the purposes of assessment in this EIS, it has been assumed that the Project will be constructed and operated in two (2) stages: Stage 1 (South) and Stage 2 (North), with each stage having a separate grid connection.	The Project would be constructed and commissioned in stages. Consistent with the EIS, it has been assumed that the Project will be constructed and operated in two (2) stages: Stage 1 (South) and Stage 2 (North), with each stage having a separate grid connection. However: <ul style="list-style-type: none"> Construction is likely to commence first in Stage 2 (North), followed by Stage 1 (South). In the event that Stage 2 (North) commences first, then the Local Transport Route Off Site Road Works and TWA facility (including associated access) would need to be established as part of Stage 2 (North). 	Figure 1.2
Estimated Development Cost (EDC)	\$2.5 Billion	No change	Not applicable

Project Element	EIS Project (As Exhibited)	Amended Project	Relevant Figure
Obstacle Lighting	Not proposed	Lighting of select WTGs and permanent meteorological masts (where required) with 200 candela medium-low intensity steady red obstacle lighting. The exact structures to be lit is subject to change through detailed design of the Project and continued consultation with the Civil Aviation Services Australia (CASA).	A conceptual Obstacle Lighting Plan is provided in Section 3 of the Amendment Report.

Note: Port to Hay Transport Routes (and associated off-site works) extend from the Port to the intersection of the Cobb Highway and Jerilderie Road. The Local Transport Route (and associated off-site road works) then continues from the intersection to the Project's site access points.

1.2 Project Timing and Sequencing

1.2.1 Overview of Project Phases and Anticipated Timing

Table 1.2 below provides an overview of the key phases of the proposed Project.

Table 1.2 Overview of Project Phases

Project Phase	Proposed Activities
Pre-construction Minor Works	<ul style="list-style-type: none"> • Surveys, including road dilapidation surveys. • Port to Hay off-site road works (refer to Section 1.3.9.1). • Local Transport Route off-site road works and installation of site access points (refer to Section 1.3.9.3). • Geotechnical investigative drilling, excavation of test pits and bore holes. • Establishment of temporary site office and compounds and signage. • Installation of environmental management and monitoring measures, fencing and meteorological masts. • Aboriginal cultural heritage salvage. • Biodiversity investigations, pre-clearance surveys and habitat feature relocation (where required). • Minor adjustments to telecommunications facilities and utility services. • Minor clearing of native vegetation to facilitate the minor works described above.
Construction Works	Includes all physical works to enable the operation of the development, including, but not limited to, the installation of WTGs, battery storage, permanent ancillary infrastructure and any temporary facilities which were not already established as part of the pre-construction minor works.
Operations	<ul style="list-style-type: none"> • Ongoing operation, monitoring (on-site and remote monitoring) and maintenance of all Project infrastructure and land within the Development Corridor during the operational lifespan of the Project. • Replacement of major components, such as WTG blades, as required (including the use of cranes and ancillary equipment to enable replacement).
Decommissioning	Includes all physical works required for the dismantling and transportation of Project infrastructure and rehabilitation of the Development Corridor, except where infrastructure (such as internal roads) may be required for ongoing farming and/or bushfire fighting purposes.

Anticipated timeframes for the Project are outlined in **Table 1.3** below. These timeframes are indicative only and may be influenced by a range of factors, including timeframes for Project approval.

Table 1.3 Anticipated Project Timeline

Phase	Approximate Duration and Indicative Timing
Pre-construction Minor Works	Approximately 6–8 months, commencing in Q4 2025 with detailed geotechnical investigations soon after project approvals are granted (nominally in Q3 2025).
Construction Works	Approximately 3 years (35 months), commencing in approximately Q4 2025 and concluding in Q4 2028.
Operations	30 years
Decommissioning	After 30-year Project life, unless a new approval is sought to repower the Project

1.2.2 Project Staging

BWF is seeking approval to construct, operate and decommission the proposed Project, as detailed in the EIS, under a single development consent. However, BWF is seeking flexibility to construct, operate, re-power and/or decommission the Project in stages of various sizes or permutations within the limits of the development consent, should the Project be approved. Staging would be determined post-development consent and subject to detailed design and procurement processes.

For the purposes of assessment, it has been assumed that the Project will be constructed and operated in two (2) stages:

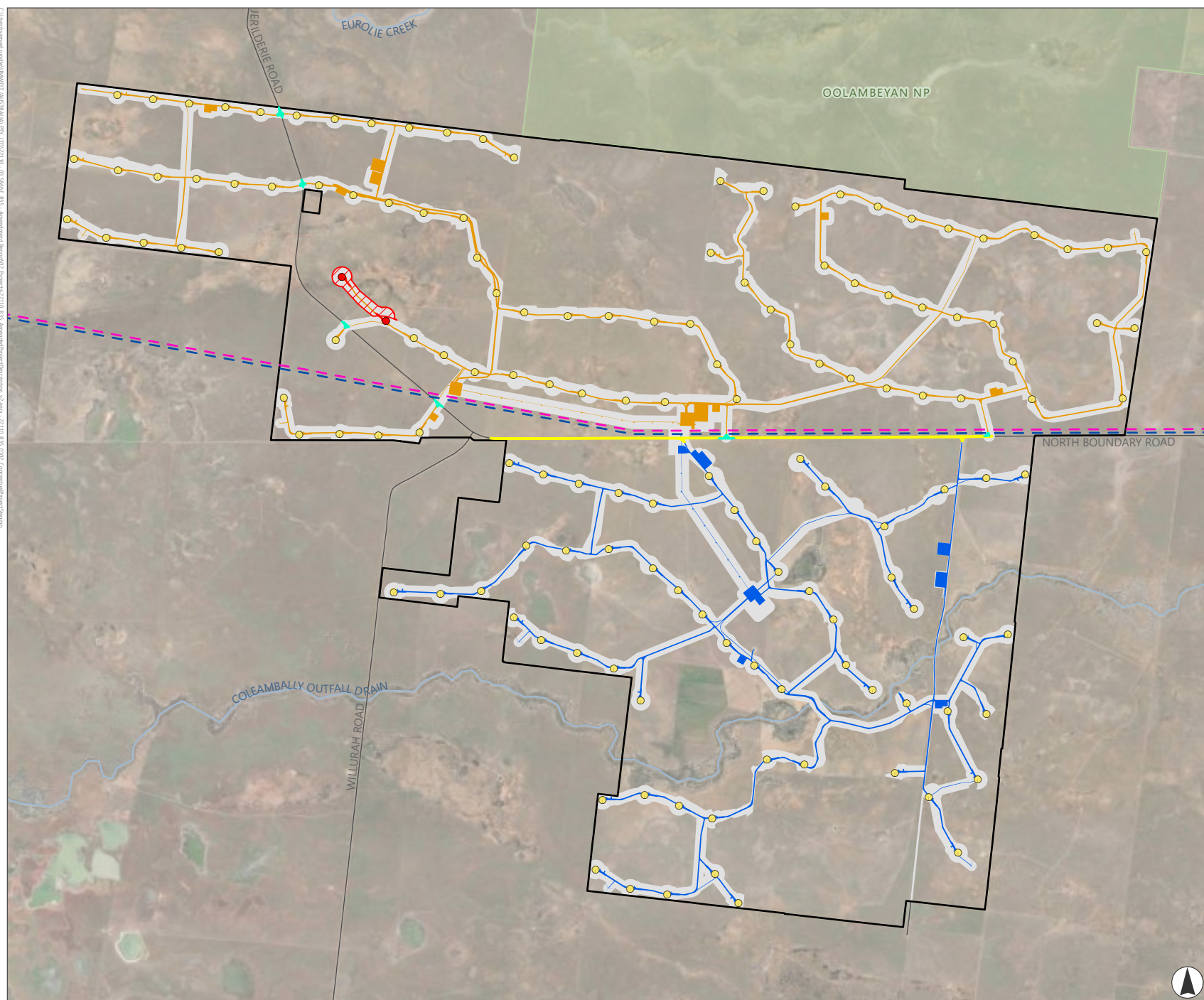
- **Stage 1 (South)** would involve the construction and operation of all Project infrastructure located south of North Boundary Road, including 58 WTGs (WTG 86 to WTG 143). Stage 1 (South) would connect to the existing Transgrid 220 kV transmission line which runs through the Project Area in an east to west direction. Stage 1 (South) therefore includes all proposed 220 kV transmission infrastructure, including a small portion which extends north of North Boundary Road.
- **Stage 2 (North)** would involve the construction and operation of all other Project infrastructure located north of North Boundary Road, including 85 WTGs (WTG 1 to WTG 85). Stage 2 (North) will connect to the 330 kV Eastern Section of Project EnergyConnect, which is now under construction and which will also run through the Project Area in an east to west direction.

Disturbance footprints for each stage shown conceptually in **Figure 1.2**, noting that staging arrangements would be confirmed post-development consent and detailed in construction and operational management plans for the Project.

BWF has identified that construction of Stage 2 (North) is likely to commence sooner than was previously indicated in the Project EIS, and may commence prior to Stage 1 (South). In the event that Stage 2 (North) commences first, then the Local Transport Route Off Site Road Works and the TWA facility (including associated access), would need to be established as part of Stage 2 (North). Final Project staging, and associated disturbance footprints, would be confirmed during detailed design.

The commencement of each stage will be dependent on BWF securing the necessary access rights for grid connection in each stage.

FIGURE 1.2
Conceptual Project Staging



- Legend**
- Project Boundary
 - Development Corridor
 - Stage 1 (South) Disturbance Footprint
 - Stage 2 (North) Disturbance Footprint
 - Stage 1 (South) Offsite Disturbance Footprint
 - Stage 2 (North) Offsite Disturbance Footprint
 - Wind Turbine Generators
 - 220kV External Transmission Line
 - 330kV Project Energy Connect Line
 - NPWS Reserves
 - Road
- To Be Removed**
- Wind Turbine Generators
 - Development Corridor
 - Disturbance Footprint



Kilometres
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Client: Environmental and Planning Unit, NSW Government, Project ID: 22110_0002_Conceptual Project Staging

1.2.3 Future Land Subdivisions

The Project also seeks the option for subdivision and boundary adjustments to occur. These may be required to subdivide lands for the 330 kV main substation connecting into Project EnergyConnect, the 220 kV switchyard connecting into the existing 220 kV transmission line, and/or other subdivisions that may be required following the detailed design of the Project e.g. where physical roads do not follow the road easement.

1.2.3.1 Subdivision/s

The network operator, at their request, requires freehold title to the main substation and/or switchyard lot/s to proceed with the construction of the relevant electrical connections and infrastructure.

Subdivision is therefore proposed for the parcels of land that the 330 kV main substation and 220 kV switchyard will be located, indicatively these include:

- Main substation (Stage 2 (North)) subdivision: Lot 26/DP750891 and Lot 86/DP750891.
- 220 kV switchyard subdivision: Lot 117/DP756317.

The new freehold lot/s created by these subdivisions will enable the ownership of the main substation and switchyard to be transferred to the network operator. The network operator will obtain freehold title either through transfer, dedication or acquisition.

The subdivision/s are administrative activities that do not involve any physical works and no new dwelling entitlements will be created as a result of the subdivision/s.

Figure 1.6 of Section 1.3.5 shows the indicative 330 kV main substation and 220 kV switchyard around which future subdivision layouts will be determined on host landholder property. Indicative subdivision layouts are also provided.

Detailed plans will be prepared to accompany applications for subdivision works certificates, that under Section 6.13 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) are required before subdivision work can be carried out in accordance with a development consent.

Subdivisions may also be required following the detailed design of the Project where it is identified that a physical road does not follow the road easement.

1.2.3.2 Long-term Leases

In order to carry out the Project, BWF will require separate long term leases to be granted by each of the host landholders over parts of existing lots where Project infrastructure will be constructed.

1.2.4 Hours of Operation

1.2.4.1 Construction and Decommissioning

Generally, the Project will undertake construction or decommissioning activities between:

- 7:00 am to 6:00 pm, Monday to Friday.
- 8:00 am to 1:00 pm, Saturdays.

However, works may be undertaken outside these standard hours under any of the following circumstances:

- the activities are inaudible at non-associated residences
- the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons
- the activities are necessary to avoid the loss of life, property or prevent material harm to the environment
- the out of hours activities are authorised by the Planning Secretary of the Department of Planning, Housing and Infrastructure (DPHI).

An example of activities that are necessary to avoid loss of property and to prevent material harm to the environment is the installation of WTGs. WTG installation is intended to fit into the six (6) day working week. However, due to the designed sequencing of component lifts certain stage/elements need to be completed in a specified order which may require early starts or late finishes, considerate of wind conditions. When erecting the tower, once the top of the tower is attached, the nacelle must go on without delay due to the risk of tower self-oscillation. Unfavourable weather can cause delays in mounting the nacelle. Continuing this work outside of standard construction hours will ensure that risk to people, property and the surrounding environment is mitigated. The Project Area is naturally a high wind area and as such, works outside of standard construction hours may be needed to make up for high wind days during the week.

Similarly, once concrete pouring commences on a given day, pouring cannot be halted and may need to be completed outside of standard hours. This is expected to be inaudible at non-associated receivers.

Out of hours activities may be authorised by the Planning Secretary of DPHI on a case by case or activity specific basis, subject to justification being provided by BWF or its contractors. This would include, for example, evidence of consultation with potentially affected non-associated residents and details of reasonable and feasible noise mitigation measures which are to be implemented.

1.2.4.2 Operations

Once the WTGs are commissioned, the Project will operate 24 hours per day, seven (7) days per week except where cessation of operations is required, for example, in the event of an emergency.

1.2.5 Project Workforce

As Stage 2 (North) is likely to commence sooner than was previously indicated in the Project EIS, a greater overlap between the construction periods for Stage 2 (North) and Stage 1 (South) is now anticipated.

Consequently, the peak workforce has increased from 350 workers at the height of construction as identified in the Project EIS, to 380 workers in this Amendment Report. This peak would occur during the height of construction for Stages One and Two and reduce thereafter, as shown indicatively in **Figure 1.3**. It is noted that this amendment reduces the overall duration of the construction period from approximately 44 months to 35 months.

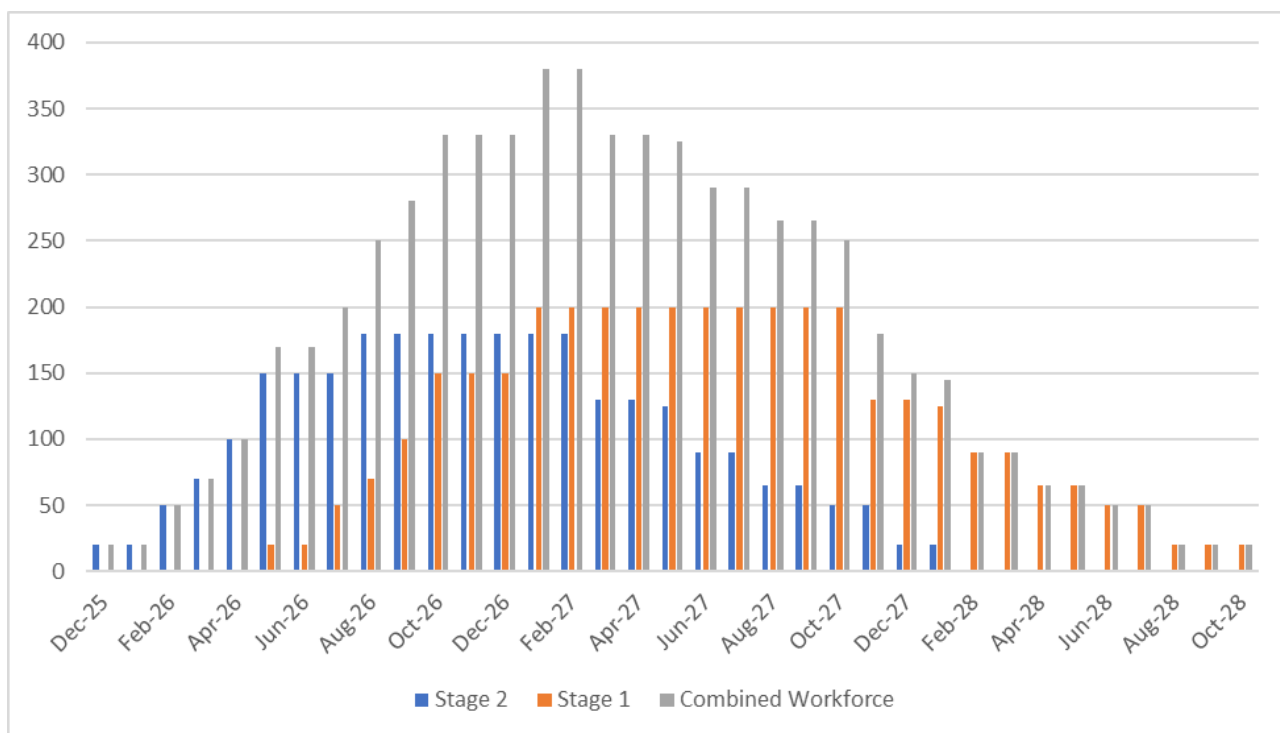


Figure 1.3 Indicative Project Construction Workforce Histogram

1.3 Project Elements

This section provides a summary of the key physical elements of the Project, including their respective quantities and approximate dimensions. Key Project infrastructure elements (including WTGs, ancillary infrastructure and temporary facilities) are summarised in **Table 1.4** to **Table 1.7** below.

Importantly, some aspects of the Project may change during the detailed design:

- For example, the WTG and battery storage model may change as technology evolves. Additionally, the exact component dimensions and quantities of ancillary infrastructure and temporary construction facilities specified in **Table 1.6** and **Table 1.7** may change.
- This flexibility will allow the final Project design to be optimised and the most appropriate and efficient infrastructure selected while still ensuring the Project’s impacts remain generally in accordance with (or less than) those assessed in **the Project EIS and subsequent Amendment Report**.
- Importantly, however, the total number and dimensions of WTGs will not exceed those specified in **Table 1.4** below, compliance with all relevant performance criteria (including noise limits) will be maintained and all Project infrastructure will remain wholly located within the Development Corridor.

Relevant assessments in **the Project EIS and subsequent Amendment Report** have considered the ‘worst case’ for each of the Project components (such as WTG height and blade length, etc). Where components of the physical layout of the Project have the potential to change over time, further detail is provided in the following sections.

Turbine Size and Assessment

The Project EIS identified a maximum proposed turbine size, being a tip height of up to 300 m, a hub height of up to 200 m and a blade length of up to 100 m. The EIS included a comprehensive environmental assessment based on this 300 m WTG in all respects, including biodiversity, heritage, visual, noise, hazards and road upgrades to the Local Transport Route, however, this assessment specifically excluded consideration of the Port to Hay Transport Routes.

The Port to Hay Transport Routes (and associated upgrades) were excluded from the EIS on the assumption that these works would be undertaken in accordance with the Memorandum of Understanding (MOU) between EnergyCo and Transport for NSW (TfNSW) for the South West Renewable Energy Zone (REZ). However, following consultation with DPPI and TfNSW during the Submissions phase (i.e. after exhibition of the Project EIS), it was confirmed that these assumed upgrades could not be relied upon. Accordingly, and as discussed in **Section 1.3.9.2**, updated Route Study Reports have been prepared for the Port to Hay Transport Routes.

Based on design considerations identified by BWF, these updated Route Study Reports were however prepared based on a smaller turbine size than that previously presented and assessed in the EIS. The updated Route Study Reports are based on a maximum tip height of up to 233 m, a hub height of up to 148 m and a blade length of up to 80 m. The identified routes, including the Port to Hay off-site road works required to facilitate OSOM transport (based on a 233 m turbine), now form part of the Amended Project.

BWF is now seeking two (2) options regarding the transport, construction and operation of WTGs for the Amended Project, being:

- A maximum WTG tip height of up to 233 m, a hub height of up to 148 m and a blade length of up to 80 m, subject to Port to Hay off-site road works being undertaken by BWF.
- A maximum WTG tip height of 300 m, a hub height of up to 200 m and a blade length of up to 100 m, subject to Port to Hay off-site road works being undertaken by the NSW Government or by a third-party developer.
- The selected option, including the final WTG dimensions, would be confirmed during detailed design.

Due to the extent of renewable energy development proposed within the South West REZ, it is possible that road upgrades to accommodate the larger turbine (up to 300 m tip height) will be undertaken along some or all of the proposed Port to Hay Routes either by the NSW Government or by a third-party developer.

Should these upgrades be undertaken prior to the Project's construction period, BWF is seeking flexibility to transport and install the larger turbine model as assessed within the Project EIS, provided that the proposed WTG dimensions do not trigger the need for any additional off-site road works.

Table 1.4 below reflects the 'larger' WTG dimensions already assessed in the Project EIS i.e. the maximum dimensions assessed for WTG installation and Local Transport Route off-site road works, and then the 'smaller' alternate WTG dimensions assessed in the Amendment Report i.e. maximum dimensions assessed for Port to Hay off-site road works.

Table 1.4 Key Project Elements: WTGs (up to 141)

Infrastructure	Maximum dimensions assessed for WTG installation and Local Transport Route off-site road works	Maximum dimensions assessed for Port to Hay off-site road works
WTG height	Up to 300 m	Up to 233 m
Blade length	Up to 100 m	Up to 80 m
Rotor diameter	Up to 200 m	Up to 163 m
Uppermost blade tip	300 m	233 m
Lowermost blade tip	Up to 100 m above ground level	Up to 66.5 m above ground level
Tower (hub) height	Up to 200 m	Up to 148 m
WTG foundations (excavation size)	Approximately 30 x 30	No change

Table 1.5 Key Project Elements: Battery Storage

Infrastructure	Approximate dimensions	Quantity
359 MW / 718 MWh battery energy storage facility	265 m x 350 m	One (1) compound, located in Stage 2 (North)

Table 1.6 Key Project Elements: Ancillary Infrastructure

Infrastructure	Approximate dimensions	Quantity
Internal access roads	Approximately 116 km in length and approximately 6 m wide.	As per conceptual Project layout
Turbine hardstands	Variable dimensions, but typically 320–350 m long and 80–100 m wide, with a combined area of approximately 137 ha.	141
Main (on-site) substation for grid connection (330 kV) (Inclusive of 330 kV Switchyard)	275 m x 275 m	One (1) in Stage 2 (North) only
Main (on-site) substation for grid connection (220 kV)	250 m x 250 m	One (1) in Stage 1 (South) only
Collector (on-site) substation	250 m x 250 m	One (1) in Stage 2 (North) only
Switchyard (220 kV)	130 m x 160 m	One (1) in Stage 1 (South) only
O&M facilities	150 m x 150 m	Up to two (2) in total: one in each stage
Overhead transmission lines (330 kV and 220 kV)	Stage 1 (South): 220 kV transmission line (Central to South) – approximately 3.6 km in length, with a pole height of up to 50 m and a typical span length of approximately 400 m. Stage 2 (North): 330 kV transmission line (North to Central) – approximately 4.5 km in length, with a pole height of up to 60 m and a typical span length of approximately 400 m.	Not applicable

Infrastructure	Approximate dimensions	Quantity
Underground transmission cables (shown as cab)	Approximately 360 km	Not applicable
Permanent meteorological masts	At hub height (refer to Table 1.4) above.	Seven (7)
Water storage tanks	At least one (1) 100,000 litre dedicated water storage tank for bushfire fighting purposes, plus storage for small quantities of potable and non-potable water required for operations, including staff amenities.	To be confirmed during detailed design

Table 1.7 Key Project Elements: Temporary Facilities

Infrastructure	Approximate dimensions	Quantity
Temporary Workforce Accommodation (TWA) Camp	310 m x 220 m	One (1) compound, located in Stage 1 (South), to be used for both construction stages ¹
Main Construction Compound	200 x 250 m	One (1) in Stage 2 (North) only
Construction site compounds, including: <ul style="list-style-type: none"> site offices, amenities and parking areas construction laydown areas for equipment and supplies rock crushing facilities and batching plants (concrete and/or asphalt) temporary stockpiling and material storage areas. 	100 m x 100 m	Four (4) in total: two (2) in each stage
Main laydown area	Stage 1 (South): 330 m x 200 m Stage 2 (North): 220 m x 100 m	Two (2) in total: one (1) in each stage
Satellite laydown area	150 m x 150 m	Six (6) total: two (2) in Stage 1 (South), four (4) in Stage 2 (North)
Main substation laydown area	65 m x 65 m	One (1) in Stage 2 (North) only
Switchyard laydown area (220 kV)	140 m long, with variable width (up to 110 m)	One (1) in Stage 1 (South) only
Pole laydown areas	20 m x 20 m	19
Borrow pits	250 m x 250 m	Two (2) in total: one (1) in each stage

Note 1: As noted in Section 1.2.2, in the event that Stage 2 (North) commences first, then the TWA facility (including associated access) which is physically located within Stage 1 (South) would need to be established as part of Stage 2 (North). Final Project staging, and associated disturbance footprints, would be confirmed during detailed design.

Sections 1.3.1 to Section 1.3.8 below provide further detail regarding the key Project infrastructure elements of the Project.

Section 1.3.9 then provides an overview of proposed off-site road works for the Amended Project, including summary tables for proposed works.

1.3.1 Wind Turbine Generators

The Project is designed to accommodate up to **141** WTGs of up to 300 m in height (to the uppermost blade tip). This enables a conservative assessment allowing for advances in WTG technology between the time of assessment for the Project and the commencement of construction.

The key components of a WTG are shown on **Figure 1.4** and include:

- foundations
- towers
- nacelle (hub)
- rotor
- blades (three (3) blades per WTG).

Additionally, each WTG will have an internal ladder or lift and a generator transformer.

As discussed in **Section 1.3** above, the Amended Project includes two (2) potential scenarios with respect to WTG dimensions. The maximum WTG dimensions considered under each scenario are outlined in **Table 1.4** above and shown in **Figure 1.4** below. The maximum dimensions assessed for WTG installation and Local Transport Route off-site road works are shown left. The maximum dimensions assessed for Port to Hay off-site road works are shown right.

The final WTG dimensions would be confirmed during detailed design.

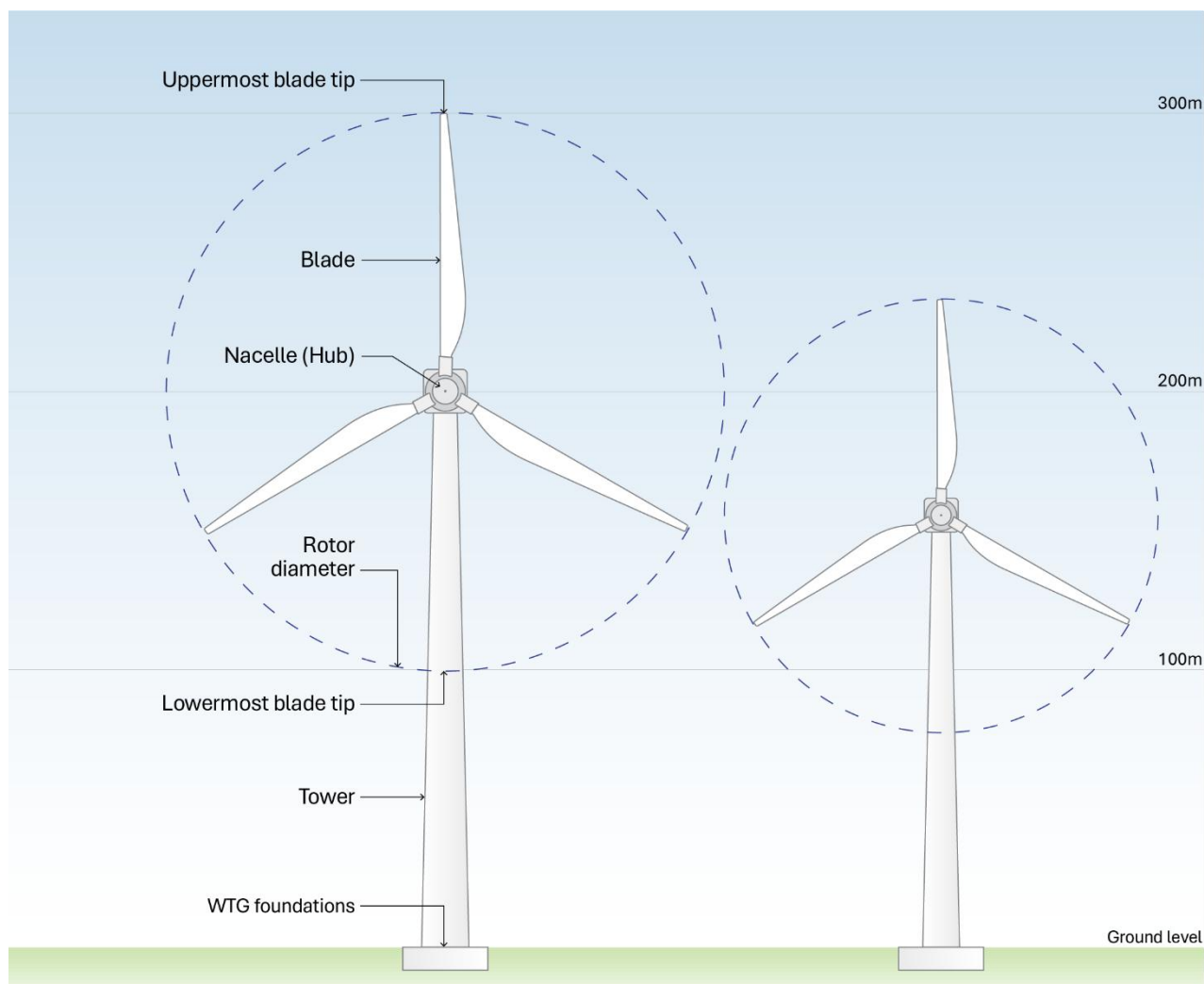


Figure 1.4 WTG Components and Maximum Proposed Dimensions

The indicative coordinates and elevation of each WTG is provided in Appendix 3 of the Project EIS. The WTGs would be installed at final locations to be confirmed within a 100 m micro-siting buffer of the proposed locations identified in the Project EIS, with the current conceptual locations shown on **Figure 1.1**.

To minimise the visual impacts of the Project, the WTGs will:

- be uniform in the colour, design, height and rotor diameter
- finished in matt-white and non-reflective material to reduce visibility
- not have any unnecessary signage.

1.3.1.1 WTG Foundations

Foundations for the WTGs will be either concrete slab or rock anchor, pending geotechnical investigation of the ground conditions across the Project Area. More than one (1) type of WTG foundation may be required for the Project, which will be determined during the detailed design phase. The excavation required for both types of foundations will be approximately 30 m by 30 m to a depth of up to four (4) m. No blasting is expected to be required for the establishment of the WTG foundations (or for any other aspect of Project construction). **Photo 1.1** shows a typical WTG foundation under construction.



Photo 1.1 Typical WTG Foundation Under Construction

Source: BayWa r.e.

1.3.1.2 Towers and Nacelle

The tower structure of a WTG is typically constructed out of welded steel, concrete or a concrete steel hybrid. The towers will be fitted with an internal ladder and/or lift to facilitate access to the nacelle. A range of tower heights are under consideration with the final selection to be undertaken during detailed design, to accommodate the proposed maximum blade tip heights (refer to **Table 1.4** and **Figure 1.4**). At the top of each tower will be a nacelle to which the rotor will be mounted.

Weather monitoring equipment located on top of the nacelle will provide data on wind speed and direction for the automatic operation of the WTG.

1.3.1.3 Blades

WTG blades are typically made from fibreglass reinforced with epoxy or plastic attached to a steel hub and include lightning protection inside the blade. The Project has been designed and assessed based on two (2) potential blade lengths as shown in **Table 1.4** and **Figure 1.4**.

Photo 1.2 shows the typical process of attaching blades to the WTG.



Photo 1.2 Blade Attachment

Source: BayWa r.e.

1.3.2 Battery Storage

A key component of the Project is battery storage, to allow for the storage and discharge of energy. Storage of energy can add significant benefits to renewable generation because it allows for the dispatch of energy in accordance with market demand and overcomes potential issues associated with intermittency of output from the WTGs. The indicative electrical capacity of the battery storage is 359 MW / 718 MWh (alternatively known as a 359 MW, up to two-hour battery). An indicative battery storage compound has been identified for the Project as shown on **Figure 1.1**. A typical battery storage arrangement is shown in **Photo 1.3**.

The battery storage compound will comprise an area of flat ground surfaced with road base or gravel, with battery components contained within standard sized shipping containers arranged in rows. A candidate battery storage model was identified for the purposes of assessment in the Project EIS. However, due to consistent evolution in battery storage technology, the preferred battery type will be determined prior to the commencement of construction, based on the available technology at that time. A range of technologies are being considered, including but not limited to lithium-ion, sodium-ion, sodium sulphur, sodium hydride, electrochemical technology (i.e. flow batteries), cryogenic storage and compressed air. The final design of the battery storage will depend on the technology selected. As such, BWF is seeking flexibility regarding the preferred battery type and internal layout within the battery storage compound, provided that environmental and safety impacts associated with battery storage remain generally in accordance with those assessed in the Project EIS.



Photo 1.3 Typical Battery Storage Arrangement

Source: Powin.

1.3.3 Permanent Ancillary Infrastructure

Permanent ancillary infrastructure required to support the Project is presented in **Table 1.1** and **Table 1.4** above and includes internal roads, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, communications cables, permanent meteorological masts and water storage tanks. It is noted that here the term 'permanent' means that the proposed infrastructure is expected to remain in place for the life of the development (subject to ongoing maintenance, upgrading or replacement), until such time as the wind farm is decommissioned and rehabilitated.

1.3.3.1 Internal Roads

Internal roads will be established within the Project Area for the construction, operation, and decommissioning of the Project. Internal roads will be constructed to a width of approximately six (6) m wide, plus an additional buffer to accommodate roadside drainage, creating a total disturbance footprint up to 25 m wide. The proposed indicative internal road network is approximately 116 km in length. Generally internal roads will be constructed using compacted crushed rock/roadbase, however some segments of the internal roads may need to be surfaced with asphalt to enable haulage of heavy WTG components.

The construction of internal roads will require approximately eight (8) creek crossings, including two (2) existing bridge crossings over Coleambally Outfall Drain as shown on **Figure 1.1**. Both crossings are located in Stage 1 (South). An assessment of both bridges will be undertaken prior to the commencement of construction and decommissioning to confirm the weight limit of these structures. It is anticipated that at least one (1) of these structures, located on Bullewah Road, will require upgrading (through underpinning or installation of additional piers within and adjacent to the Outfall Drain) to accommodate the abnormal loads necessary to carry out the Project. Alternatively, a temporary bridge structure could be constructed alongside the existing bridge, and wholly within the proposed Development Corridor, which would then be removed at the conclusion of construction. The second bridge structure is likely to be utilised by light to medium sized vehicles only and may not require any additional upgrades, however, this will be determined prior to the commencement of construction and any upgrades (if required) will be undertaken. For all other crossings, culverts will be installed within drainage lines as required.

All watercourses crossings will be designed for a 10% Annual Exceedance Probability (AEP) rain event. Additionally, the detailed design of any bridge upgrades (or proposed temporary bridges) and culvert structures will have regard to the following guidelines:

- Managing Urban Stormwater: Soils and Construction (Landcom, 2004).
- Policy and Guidelines for Fish Friendly Waterway Crossings (NSW DPI, 2004).
- Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003).

Several creek crossings may also be required to support the required machinery access during the construction phase. Crossings not required for future operational activities will be decommissioned following the completion of construction works. Those that are required for ongoing use during operations will be designed and constructed in accordance with relevant standards.

1.3.3.2 Hardstands

Hardstands are required adjacent to each WTG location for the assembly, erection, maintenance, and decommissioning of the WTGs. Hardstand dimensions are variable and will depend on detailed design, topography, construction methods and the selected WTG model. Hardstands will be surfaced with pavement material consistent with internal roads and be maintained throughout the construction and operational life of the Project. **Figure 1.5** and shows a typical hardstand area adjacent to a WTG footing. **Photo 1.4** shows a typical WTG hardstand area for a completed wind farm project.



Photo 1.4 Typical WTG Hardstand Area

Source: BayWa r.e.

FIGURE 1.5
Typical Hardstand Area



- Legend
- Development Corridor
 - Disturbance Footprint
 - Wind Turbine Generator
 - Hardstand Area
 - Cable Corridor
 - Tracks Connecting Hardstands



Meters

Scale 1:3,014 at A4
GDA2020 MGA Zone 55

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1.3.3.3 Main and Collector Substations and Switchyards

Substations are required to collect the electricity generated and increase the voltage for transmission to the grid, and to physically connect to the grid (i.e. switching station). The Project design includes:

- Two (2) main substations, with one (1) located in Stage 1 (South) measuring 250 x 250 m and one (1) located in Stage 2 (North) measuring 275 m x 275 m. The Stage 2 (North) main substation (330 kV) compound will also incorporate a switchyard.
- One (1) standalone switchyard (220 kV) in Stage 1 (South), which will be located within a compound measuring approximately 130 m by 160 m.
- One (1) collector substation in Stage 2 (North), which will be located within a compound measuring approximately 250 m by 250 m. nt storage facilities and a communication tower. Each of the substation/switchyard compounds will be loc
- A typical substation layout is shown in **Photo 1.5** below. The substation and switchyard compounds would include transformers, voltage controls, switchgear, equipme ated on a pad constructed of roadbase (or similar) and enclosed with security fencing. Emergency backup power will be supplied by an on-site diesel generator and/or batteries to maintain network communications and electrical protection capability in the event of an outage.



Photo 1.5 Typical Substation

Source: BayWa r.e.

As the substation transformers may each contain upwards of 50,000 L of oil, the detailed Project design will include primary and secondary containment measures so that any spills are captured. The substations and switchyard have been designed to minimise the visual impact of the Project by siting the infrastructure away from residences and surrounding public viewpoints as far as practical whilst maintaining the practical and operational needs of the infrastructure. Following construction, and if warranted, raised earthwork perimeters and/or small areas of native tree planting may be undertaken to screen any parts of the substations or switchyard that are visible from sensitive receptors and roadside vantage points.

Security lighting required within the substation and switchyard compounds will be designed and installed to comply with AS 4282 Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, 2019) and any additional requirements as advised by the Civil Aviation Service Australia (CASA), and with due regard to the National Light Pollution Guidelines for Wildlife (Commonwealth Department of the Environment and Energy (former), 2020).

1.3.4 O&M Facilities

At least one (1) permanent O&M facility will be established for the day-to-day operation of the Project. Two (2) indicative O&M facilities are shown in **Figure 1.1**, with one (1) located in Stage 1 (South) and one (1) located in Stage 2 (North). BWF is seeking flexibility to construct one (1) or both of these facilities.

Each O&M facility compound measures approximately 150 by 150 m. The O&M compounds will include site operations facilities and services buildings, workshop, storage, parking and other facilities for operational staff. The buildings of the operations compound will include office space, amenities, kitchen, communications equipment, meeting room and routine maintenance stores. The O&M facilities will require a standalone power supply from either the local electricity distribution network, or an on-site generator. It is anticipated that bushfire fighting equipment, including water tanks, would be stored at the O&M facilities during operations and would be accessible by emergency services in the event of a bushfire.

Operational and security lighting will be required within O&M facilities. Lighting will be designed and installed to comply with AS 4282 Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, 2019) and any additional requirements as advised by CASA, and with due regard to the National Light Pollution Guidelines for Wildlife (Commonwealth Department of the Environment and Energy (former), 2020).

1.3.5 Underground and Overhead Transmission Lines and Poles

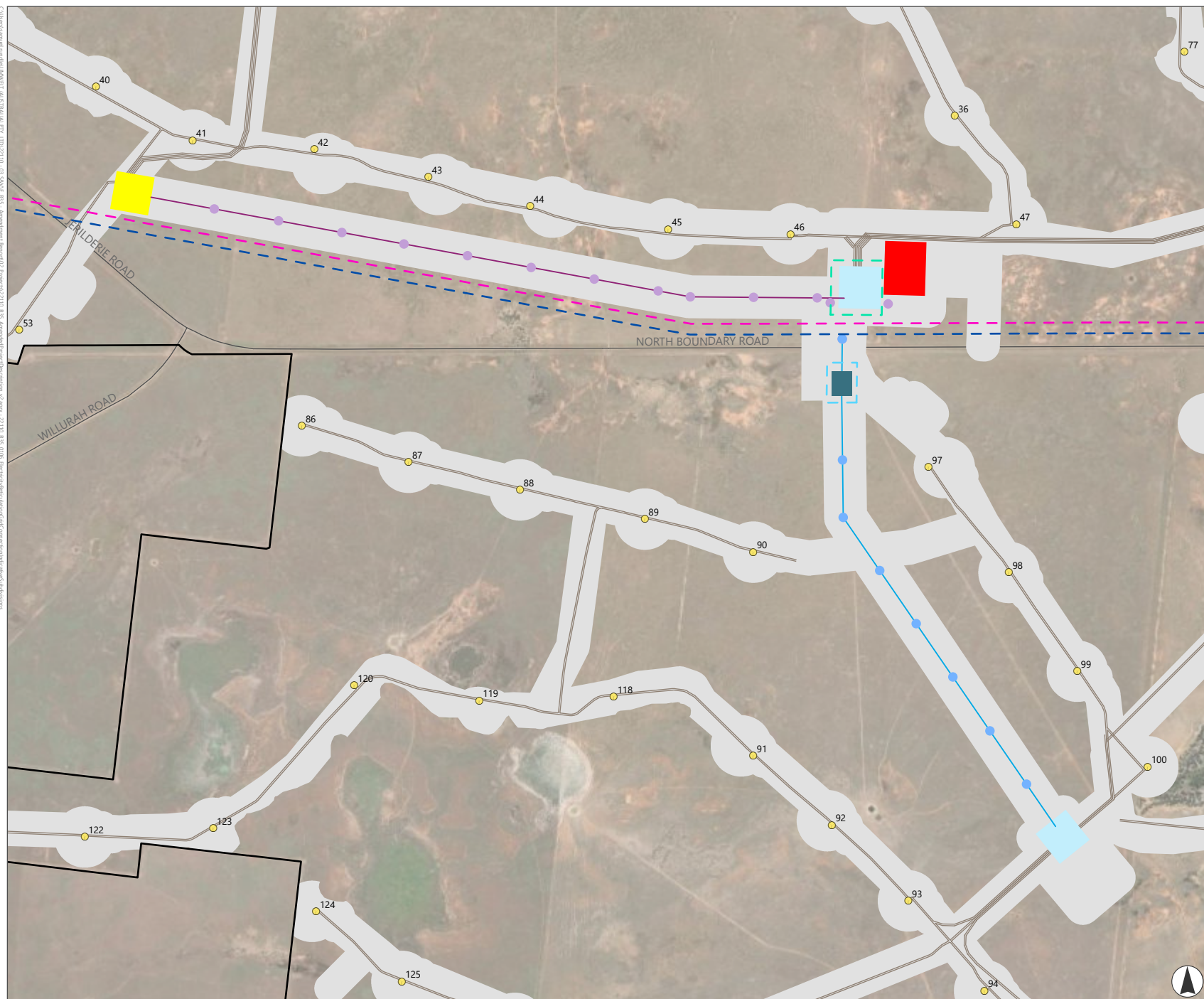
A series of underground and overground electrical network lines are proposed to deliver the electricity generated by the WTGs to the substations and ultimately to connect to the grid. The proposed WTGs will be connected via underground cabling, via the cable corridor shown in **Figure 1.6**.

- In Stage 1 (South), the underground cabling will connect to the main substation, at which point electricity will be transmitted via a new 220 kV internal overhead transmission line (Central to South), passing through the switchyard to the meshing point with the Transgrid 220 kV transmission line, just north of North Boundary Road.

- In Stage 2 (North), the underground cabling will connect to the collector substation, at which point electricity will be transmitted via a new 330 kV internal overhead transmission line (North to Central), to the main substation area. The battery storage (located adjacent to the main substation) will directly connect into the main substation area via the underground cable corridor, and ultimately, to the switching station (within the 330 kV main substation compound) cutting into the Project EnergyConnect transmission line.

All of the Project's proposed electricity transmission infrastructure will be located within the Project Boundary under agreement with the Host Landholders.

FIGURE 1.6
Electricity Reticulation, Grid Connection and Indicative Subdivisions



- Legend**
- Project Boundary
 - Development Corridor
 - Wind Turbine Generators
 - 330kV Transmission Poles
 - 220kV Transmission Poles
 - 220kV Internal Transmission Line (Central to South)
 - 330kV Internal Transmission Line (North to Central)
 - 330kV Project Energy Connect Line
 - 220kV External Transmission Line
 - 220 kV Switchyard
 - Battery Storage
 - Main Substation
 - Collector Substation
 - Cable Corridor
 - Road
- Indicative Subdivision Lots**
- 330 kV Main Substation Lot
 - 220 kV Switchyard Lot



0 250 500

Meters

Scale 1:35,000 at A4
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1.3.6 Telecommunications Facilities and Utility Services

Table 1.8 below summarises the telecommunications facilities and utility services which will support the operational phase of the Project. Where possible, any ground disturbance associated with the installation and maintenance of telecommunications facilities and utility services will be located within the Development Corridor, and all ground disturbance will be sited to avoid key environmental constraints within the Project Area.

Table 1.8 Telecommunications Facilities and Utility Services

Service	Approximate Duration and Indicative Timing
Telecommunications	Telecommunications facilities providing for transmission of voice, data, image, graphic and video information are proposed to be installed within the Project Area, both at standalone locations and attached to Project infrastructure such as permanent meteorological masts. Telephone communications facilities (optic fibre and microwave) will be required to be installed between the substations to enable safe remote monitoring and control of the Project.
Electricity Supply	The Project will be connected to the transmission network and, when not generating, will draw a minor amount of electricity from the grid. Backup and emergency power at the substations may be supplied by a local electrical distribution line, on-site batteries and/or a standalone diesel generator.
Operational Water Supply	Operational water requirements will be provided to the proposed facilities and auxiliary services buildings from storage tanks designed to collect water from roof drainage and augmented by potable water delivered by tankers.
Operational Waste Disposal	Approved septic systems or composting systems will be installed to treat minor quantities of wastewater associated with operation of the Project, subject to securing the relevant authorisations. Other wastes will be classified and removed from the Project Site to an approved facility (landfill, recycling etc). Waste management is described further in Appendix 2 of the Amendment Report.

1.3.7 Permanent Meteorological Masts

Up to seven (7) permanent meteorological masts are proposed to be installed throughout the Project Area as shown in **Figure 1.1**. The purpose of these masts is to aid performance monitoring of the WTGs.

The permanent meteorological masts would be of a guyed, narrow lattice or tubular steel design with concrete footings with an expected maximum height of 200 m, **or a height** consistent with the maximum hub height of the **selected** WTGs. Indicative locations for these masts are yet to be determined and will be influenced by the final WTG selection.

For functional reasons, the meteorological masts must be located close to the WTGs but with sufficient separation distance to enable accurate wind measurements. To overcome those separation requirements and select locations for the meteorological masts that provide the functionality required, the masts and the guy wires that secure them may need to be located outside of the Development Corridor, however, they will remain within the Project Area. For the purposes of assessment in the Project EIS, indicative locations for all permanent meteorological masts were incorporated into the Development Corridor (and Disturbance Footprint) and assessed.

The locations will be selected to minimise impacts including consideration of heritage, biodiversity, land use, visual and water impacts, and in consultation with the landowner. Permanent meteorological masts will require a low voltage cable connection for power and a communications cable to be laid. The trench required for this will be approximately one (1) m in width and would come from the closest WTG.

Photo 1.6 shows a typical meteorological mast.



Photo 1.6 Typical Meteorological Mast

Source: BayWa r.e.

1.3.8 Temporary Facilities

Temporary facilities required to support the construction phase of the Project include the TWA, site offices, amenities, construction compounds and laydown areas, on-site borrow pits, rock crushing facilities, concrete or asphalt batching plants, minor ‘work front’ construction access roads, environmental management and monitoring and signage.

These temporary construction facilities are described in the following subsections. All temporary facility sites that are not required for the ongoing operation of the Project will be rehabilitated once they are no longer required. The Project’s Biodiversity Management Plan (BMP) will guide rehabilitation activities for the Project, with a focus on returning disturbed areas to a vegetation type consistent with their pre-disturbance type (e.g. pasture will be rehabilitated to pasture, native woodland will be rehabilitated to native woodland etc.). BWF will also undertake geotechnical investigations as part of the construction of the Project. These works will occur throughout the Development Corridor as required to inform detailed design and construction activities.

It is noted that two (2) temporary meteorological masts have already been erected on site by BWF. The as-built locations of these masts are shown in **Figure 1.1**. These temporary meteorological masts are exempt development under the provisions of State Environmental Planning Policy (Transport and Infrastructure) 2021 and do not form part of the Project.

1.3.8.1 Temporary Workforce Accommodation Camp

The TWA compound would be accessed off North Boundary Road via Bullewah Road as shown in **Figure 1.1**.

The TWA compound has been sized to accommodate the Project’s peak construction workforce of 380 FTE personnel, noting that approximately nine (9) percent of the Project’s workforce is expected to be based locally. It is assumed that the majority of workers staffing the TWA camp would live locally.

The conceptual TWA design includes sleeping accommodation, site offices, meal facilities, ablutions, medical facilities, car parking, laundry services, a small on-site retail shop, tavern and gymnasium. These facilities will consist of pre-fabricated demountable modules which will be delivered and installed on site. A conceptual TWA layout is included in **Appendix 2 of the Amendment Report**.

All buildings will have emergency lighting, smoke alarms and firefighting capability in accordance with the Building Code of Australia. Appropriate firefighting equipment will be installed (portable fire extinguishers/fixed fire hose reels/fire hydrant systems and water tanks). Implementation will be subject to detailed specialist consultant design. Emergency evacuation and emergency assembly points will be established for the TWA as required.

The TWA compound will incorporate temporary sewage management facilities, most likely using a pump out system with all effluent to be transported off-site by tanker truck for disposal at an appropriately licensed facility.

Temporary flood lighting will be installed at the TWA compound for security and emergency purposes. All lighting will be designed and installed to comply with AS 4282 Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, 2019) and any additional requirements as advised by CASA, and with due regard to the National Light Pollution Guidelines for Wildlife (Commonwealth Department of the Environment and Energy (former), 2020).

Following the completion of the construction phase, the TWA compound would be dismantled and rehabilitated. All TWA infrastructure will be removed from site, except where it is required for the operation of the Project or ongoing farming purposes (e.g. site access points and internal roads).

1.3.8.2 Construction Compounds

A total of five (5) construction compounds are proposed, comprising one (1) main construction compound (measuring approximately 200 m by 250 m) and four (1) smaller construction compounds (measuring approximately 100 m by 100 m) as shown indicatively on **Figure 1.1**. The construction site compounds would incorporate:

- site offices, amenities and parking areas
- construction laydown areas for equipment and supplies
- rock crushing facilities and batching plants (concrete and/or asphalt)
- temporary stockpiling and material storage areas.

Site Offices, Amenities and Parking Areas

The construction phase will require temporary infrastructure such as portable field offices, toilet facilities and parking bays within the temporary construction compound locations. Arrangements will be made for power and communications connections to the site offices during the construction period. During construction, sewage will be managed through temporary pump out systems.

No overnight worker accommodation is proposed within the construction compounds. All Project worker accommodation facilities will be contained within the TWA compound (refer to **Section 1.3.8.1**).

Construction Laydown Areas

The construction compounds may also be utilised for receiving and storing equipment and supplies (other than WTG components and transmission poles, which have their own dedicated laydown areas as described in **Section 1.3.8.3**).

Rock Crushing Facilities and Batching Plants

Temporary rock crushing facilities and batching plants (concrete and/or asphalt) are proposed to process excavated material for the WTG foundations, electrical infrastructure and internal roads (and other construction needs) and to produce concrete for Project construction activities including WTG foundations.

Rock crushing facilities would occupy an area of approximately 50 m by 50 m and consist of a mobile crushing plant and associated stockpiles and working area. Each facility is sized for the use of front-end loaders, delivery of materials and entry and exit of vehicles and to have sufficient storage area for materials for five (5) days batching/crushing. Suitable locations for such facilities will be located within the Development Footprint, subject to detailed design and construction programming. Temporary rock crushing may occur throughout the Development Corridor using mobile plant, if required, following excavation of rock material to reuse in the immediate area and maximise construction efficiency. Material excavated on-site for WTG and compound foundations and internal road alignments will be crushed on-site and used for road base or aggregate subject to meeting the relevant functional specifications.

A typical on-site concrete batching facility would occupy an area of approximately 50 m by 50 m and likely consist of a concrete mixer, cement bins, sand and aggregate stockpiles and storage facilities for various equipment and tools.

Temporary Stockpiling and Materials Storage Areas

Stockpiling of materials will be undertaken to maximise construction efficiencies and minimise waste being exported from the Project Site, including excavated materials (e.g. topsoil, subsoil, rock) and gravel/roadbase.

Stockpiles will be established and utilised adjacent to excavations for WTG foundations, internal roads, compounds and laydown areas for the duration of construction. Stockpile and storage requirements have been considered in the Development Corridor. Fuel and any other chemicals stored in compound areas will be stored in appropriately designed, bunded storage facilities and trucked to plant in the field.

1.3.8.3 Laydown Areas

Laydown areas will be required in strategic locations along the Development Corridor, including adjacent to WTG locations, substations and switchyard compounds and internal overhead transmission lines. Indicative locations for these laydown areas are shown in **Figure 1.1**, however, the final siting of these areas will be determined during detailed design. Locations will be selected to minimise environmental and social impacts associated with the key values identified in Section 6.0 of the EIS and will occur within the Development Corridor.

1.3.8.4 Borrow Pits

Two (2) proposed gravel borrow pits are proposed to be utilised on site, at the locations shown in **Figure 1.1**. One (1) borrow pit is proposed in each of Stage 1 (South) and Stage 2 (North). The Stage 1 (South) borrow pit is an existing quarry pit which has been used historically to maintain farm tracks and Council roads, which would be expanded for the purposes of Project construction. The Stage 2 (North) borrow pit would be a newly established borrow pit used specifically for the Project. The two (2) borrow pits will measure approximately 250 m by 250 m. Both borrow pits are located within the Project's Development Corridor and are accounted for within the Project's Disturbance Footprint (refer **Figure 1.1** and **Figure 1.2**).

Extraction within the borrow pits will not exceed a depth of three (3) m above the regional groundwater table. As the regional groundwater table is estimated to be at least 20 m below ground level, this means that extraction depth within the borrow pits would not exceed 17 m below ground level.

Total on-site gravel extraction from the borrow pits over the construction period would be in the order of 695,000 tonnes, **or 232,000 tonnes (rounded) per annum for three (3) years**. This assumes up to 50% of total gravel required for Project construction would be sourced on site. This is significantly below the SSD triggers for extractive industry under the Planning Systems SEPP (refer to Schedule 1, Clause 7).¹

¹ Under Schedule 7, Clause 1 of the Planning Systems SEPP, the relevant SSD triggers are extracting more than 500,000 tonnes of extractive material per year or extracting from a total resource of more than 5 million tonnes.

1.3.8.5 Minor Construction Access Roads

Construction roads, tracks and use of unformed access paths (e.g. light vehicle movements over farmland areas) will be required to facilitate some parts of the Project including, for example, the erection of overhead transmission lines and maintaining environmental management measures. Construction roads that are not required for the ongoing operation and maintenance works of the Project will be removed and rehabilitated on completion of the construction phase unless landowners request the roads to remain.

1.3.8.6 Environmental Management and Monitoring

BWF will implement a comprehensive range of environmental management and monitoring measures, as outlined in Appendix 3 of the Amendment Report. These measures will include, but not be limited to:

- the establishment and maintenance of erosion and sedimentation control structures
- the establishment and maintenance of APZ.

1.3.8.7 Signage

Traffic signage required as part of traffic safety for the Project will be installed in compliance with relevant regulations and in accordance with any permits obtained for traffic management. Signage will be erected at critical locations from the outset of construction, directing all vehicles associated with the construction site to the Project Site office. Additional signage would be located at or near entry points, providing information about the Project, the companies involved and essential safety information and telephone numbers.

Consultation with relevant local Councils and Transport for NSW (TfNSW) will be initiated to determine final signage locations.

1.3.9 Off-Site Road Works

1.3.9.1 Port to Hay Transport Routes

The Amended Project proposes five (5) Port to Hay OSOM transport route options. This includes three (3) route options from the Port of Newcastle, and two (2) route options from Port Adelaide. These transport routes will be utilised to deliver Project components, including WTG towers and blades, and other larger project components to the Project Area. Several routes have been identified to transport specific Project components, due to vehicle height and length restrictions along the routes. These transport routes, intended uses and maximum load heights are detailed in **Table 1.9** below and are shown in **Figure 1.7**.

The remainder of the transport route (i.e. the Local Transport Route, which extends from the intersection of the Cobb Highway and Jerilderie Road to the various site access points) is separately discussed in **Section 1.3.9.3** below.

Table 1.9 Port to Hay Transport Routes

Transport Route	Intended Use and Maximum Load Height	Route Length and Geographic Description
Route 1. Newcastle, NSW	Maximum loaded height of 4.9 m for WTG blades to use North Connex tunnel.	This route is approximately 955 km and travels through NSW from the Port of Newcastle to the Project Area through Sydney, Goulburn, Wagga Wagga and Narrandera (amongst other townships and localities).
Route 2. Newcastle, NSW	Maximum loaded height of 6.1 m for WTG towers.	This route is approximately 1,071 km and travels through NSW from the Port of Newcastle to the Project Area through Muswellbrook, Dubbo, Parkes and Narrandera (amongst other townships and localities).
Route 3. Newcastle, NSW	Maximum loaded height of 5.3 m for all remaining loads via Pennant Hills Road	This route is approximately 956 km and travels through NSW from the Port of Newcastle to the Project Area through Sydney, Goulburn, Wagga Wagga and Narrandera (amongst other townships and localities).
Route 1. Adelaide, South Australia (SA)	Maximum loaded height of 5.2 m for WTG blades, motors and general loads.	This route is approximately 820 km and travels through South Australia, Victoria and NSW from Port Adelaide to the Project Area through Gawler, Nuriootpa, Blanchetown, Loxton, Red Cliffs, Robinvale and Hay (amongst other townships and localities).
Route 2. Adelaide, SA	Maximum loaded height of 6.4 m for WTG towers.	This route is approximately 847 km and travels through South Australia, Victoria and NSW from Port Adelaide to the Project Area through Two Wells, Kapunda, Blanchetown, Loxton, Red Cliffs, Robinvale and Hay (amongst other townships and localities).

Typical delivery of these WTG components is shown in **Photo 1.7** and **Photo 1.8** below.



Photo 1.7 **Delivery of Typical WTG Tower**

Source: BayWa r.e.



Photo 1.8 Typical Delivery of WTG Blades

Source: BayWa r.e

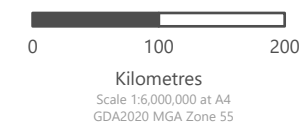
FIGURE 1.7
Port to Hay Transport Routes



- Legend**
- Project Boundary
 - State Border
 - NPWS Reserves
 - State Forest
 - Road
- Port of Newcastle Routes**
- Route 1 - 4.9m max loaded height - blades
 - Route 2 - 6.1m max loaded height - towers
 - Route 3 - 5.3m max loaded height - all remaining loads
- Port Adelaide Routes**
- Route 1 - 5.2m max loaded height - blades, motors, general loads
 - Route 2 - 6.5m max loaded height - towers

Note: Section 1.3.9.1 of the Amended Project Description discusses an alternative transport route for blades via the Newcastle Inner City Bypass. BWF is seeking the flexibility to use the Newcastle Inner City Bypass should the works be undertaken by the NSW Government or a third party, and which can accommodate the transportation of the blades described in the Project SSDA.

Note: Transport Route beyond NSW State border is shown for context, but not assessed for the Project SSDA.



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1.3.9.2 Port to Hay Off-Site Road Works

Route Study Reports have been undertaken by Rex J Andrews Engineered Transportation (RJA) for the respective route options from the Ports of Newcastle and Adelaide, based on a maximum blade length of up to 80 m. These reports are included as Appendix A of the Amended TIA ([Appendix D of Response to RFI#2](#)).

The Route Study Reports identify areas along the Port to Hay Transport Routes where road modifications would be required to enable the safe transport of Project components using OSOM vehicles. In some instances, these road modifications result in disturbance outside of the existing road pavement, which has warranted further assessment of relevant environmental constraints within this Amendment Report. A due diligence process has also been undertaken to confirm land ownership at these locations and consent has been sought for inclusion of these areas in the Amended Project SSD application.

Table 1.10 provides an overview of the proposed Port to Hay off-site works and identifies the specific works which require further assessment within the Amendment Report. The locations of the proposed Port to Hay off-site road works are then shown in **Figure 1.8** below, where road modifications are proposed.

Where the proposed off-site works include physical changes to the road pavement, including the installation of additional hardstand, or changes to existing traffic islands, roundabouts or kerbs, a strategic design for the proposed works has been undertaken and is provided in [Appendix E of the Response to RFI#2](#). Other treatments that do not involve road modifications have also been included in the table below for completeness, however no strategic concept designs have been prepared.

It is noted that **Table 1.10** identifies off-site road works for all Port to Hay Transport Route options. These works will only be undertaken where BWF elects to use that specific route option for OSOM transport, which will be confirmed during detailed design.

In relation to the Port Adelaide to Hay Routes, as noted in **Table 1.1** above, the Amended Project includes identified Port to Hay off-site road works within the State of NSW. For the remainder of these routes, all necessary approvals will be secured under relevant South Australian and Victorian legislation, and all required off-site works completed, prior to the commencement of Project construction, should BWF choose to utilise the Port Adelaide to Hay Route options.

Table 1.10 Port to Hay Off-site Road Works

Relevant Port	Location	Description of proposed road modification	Chainage (km from Port)	Further assessment required?
Adelaide	Murray Valley Highway onto Sturt Highway at Euston, NSW.	Additional hardstand and associated fill required to bring new hardstand area level with the highway. Sign to be relocated.	546 km (Route 1)	Works are within an undisturbed road reserve with vegetation present. Further assessment undertaken within the Amended BDAR and Addendum ACHAR, included as Appendix A and Appendix C of Response to RFI#2, respectively.
Adelaide	Right hand bend on Sturt Highway at Balranald, NSW. ¹	Option 1: Hardstand will be required on inside of corner along with the removal of trees, light poles and numerous signs. Median strips to be made trafficable/replaced with painted lines. The Project has received landowner consent from the property owner at the inside of the corner. Option 2: Hardstand will be required on the outside of corner along with the removal of vegetation, light poles and numerous signs. Median strips to be made trafficable/replaced with painted lines. The proposed road upgrades are contained within the TfNSW road reserve.	623.7 km (Route 1)	Works are within an undisturbed road reserve with vegetation present. Nearby AHIMS site also present. Further assessment undertaken within the Amended BDAR and Addendum ACHAR, included as Appendix A and Appendix C of Response to RFI#2, respectively.
Adelaide	Roundabout on Sturt Highway at Hay, NSW onto Cobb Highway.	Several light poles and signs to be removed or relocated. Hardstand to be installed on exit of corner.	750 km (Route 1)	Works are within an undisturbed road reserve with vegetation present. A PCT is also mapped. Further assessment undertaken within the Amended BDAR and Addendum ACHAR, included as Appendix A and Appendix C of Response to RFI#2, respectively.
Newcastle	Selwyn Street onto Industrial Drive via George Street at Mayfield, NSW	Sign to be removed and replaced for each blade movement. No road modifications proposed.	1.3 km (Route 1)	Sign removal and relocation only proposed. Sign relocation will occur within heavily disturbed road reserve. No specialist assessment required.
Newcastle	John Renshaw Drive onto the M1 at Beresfield	Sign to be relocated or lowered. No road modifications proposed.	18.4 km (Route 1)	Sign removal and relocation (or lowering only) proposed. Sign relocation will occur within heavily disturbed road reserve. No specialist assessment required.

Relevant Port	Location	Description of proposed road modification	Chainage (km from Port)	Further assessment required?
Newcastle	Wagga Wagga – Roundabout at the corner of Edward Street and Pearson Street.	Existing apron on the roundabout to be traversed by the transporter. Centre of roundabout to be made trafficable. Sign to be made removable or relocated.	614.6 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Wagga Wagga – Roundabout at the corner of Mason Street and Hammond Ave.	Existing apron on the roundabout to be traversed by the transporter. Centre of roundabout to be made trafficable. Sign to be made removable or relocated.	617.3 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Wagga Wagga – Roundabout at the corner of Koorigal Road and Hammond Ave.	Existing apron on the roundabout to be traversed by the transporter. Centre of roundabout to be made trafficable. Sign to be made removable or relocated.	618.4 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Wagga Wagga – Roundabout at the corner of Tasman Road and Hammond Ave.	Existing apron on the roundabout to be traversed by the transporter. Centre of roundabout to be made trafficable. Sign to be made removable or relocated.	621.5 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Left hand bend on the Sturt Highway at Gillenbah, NSW.	Several signs to be relocated or made removable. Light/power pole to be relocated out of swept path. Section of traffic island to be made trafficable. Suitable trailer to be used in order to straddle centre median.	711 km (Route 1)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Golden Highway through Merriwa, NSW.	No parking area needs to be put in place and some vegetation to be trimmed. Islands to be made trafficable or chevrons lines put in place. Several signs and bollards will need to be made removable.	224.5 to 224.8 km (Route 2)	Located within heavily disturbed road reserve. Vegetation at works area confirmed as exotic planted street tree. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.

Relevant Port	Location	Description of proposed road modification	Chainage (km from Port)	Further assessment required?
Newcastle	Mitchell Highway onto Derribong Street, Narromine, NSW.	Modifications to the existing hardstand on the outside of the corner to improve safety in all weather conditions.	450 km (Route 2)	Located within heavily disturbed road reserve. Qualitative assessment undertaken within Amendment Report, with no further specialist assessment required.
Newcastle	Newell Highway intersection with Dowling Street at Forbes, NSW.	No parking area to be put in place. No physical road modifications proposed.	590 km (Route 2)	Sign posting change only. No specialist assessment required.
Newcastle	Newell Highway (Cadell St) at Narrandera, NSW.	Trees to be trimmed. No road modifications proposed.	824-827 km (Route 2)	Trimming of planted <i>Melia azedarach</i> (White cedar) proposed. As outlined in the Planted Vegetation Streamlined Assessment Module (Appendix J of the Amended BDAR [Appendix A of Response to RFI#2]), minor trimming proposed to these trees is unlikely to have a material impact on foraging resources for avifauna species and coupled with the retained planted native vegetation in the wider locality (and the retention of the trees in question) the impacts are considered negligible. No further assessment of biodiversity values is required.
Newcastle	Newell Highway onto Sturt Highway at Gillenbah, NSW.	Sign to be relocated or made removable.	829 km (Route 2)	Sign removal and relocation only proposed. Sign relocation will occur within heavily disturbed road reserve. No specialist assessment required.

Note 1: the Route Study prepared from Port Adelaide to the Project Area includes two (2) road modification options at this location i.e. the right hand bend on Sturt Highway at Balranald, NSW. Both options are presented in Appendix A of the Revised TIA (Appendix D of Response to RFI#2), and concept designs for both options are provided in Appendix E of Response to RFI#2. The final route selection at this location would be confirmed following Project approval.

FIGURE 1.8A
 Port to Hay Transport Routes -
 Off-site Road Work Areas (Euston)



Legend

- Road
 - Lot/DP
 - NSW Road Corridor
 - Off-site Road Works Area - Euston
- Port Adelaide Routes**
- Route 1 - 5.2m max loaded height - blades, motors, general loads
 - Route 2 - 6.5m max loaded height - towers



Metres
 Scale 1:1,000 at A4
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FIGURE 1.8B(a)
Port to Hay Transport Routes -
Off-site Road Work Areas
(Balranald, Option 1)



Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Balranald Option 1

Port Adelaide Routes

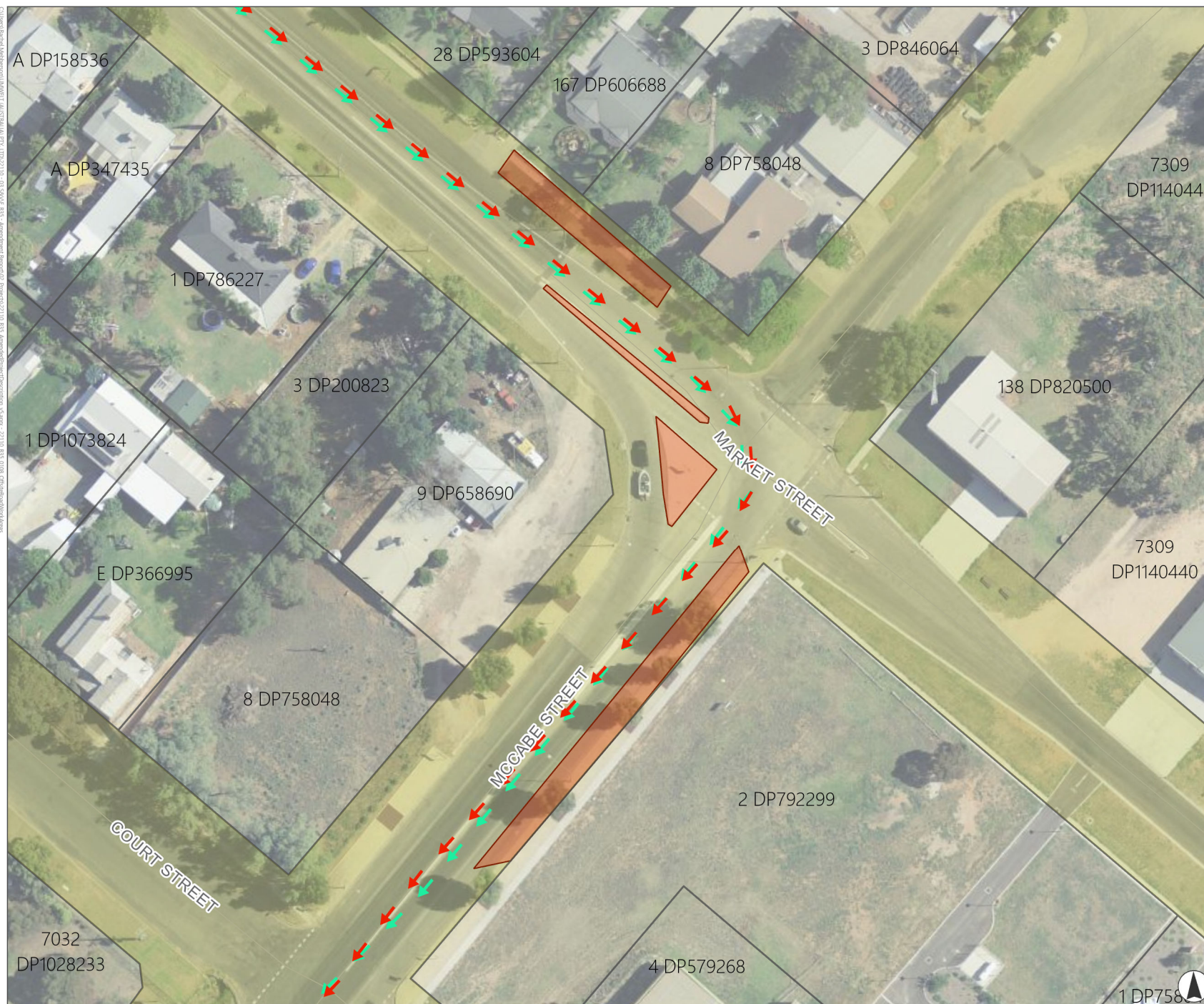
- Route 1 - 5.2m max loaded height - blades, motors, general loads
- Route 2 - 6.5m max loaded height - towers



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FIGURE 1.8B(b)
 Port to Hay Transport Routes -
 Off-site Road Work Areas
 (Balranald, Option 2)



Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Balranald Option 2

Port Adelaide Routes

- Route 1 - 5.2m max loaded height - blades, motors, general loads
- Route 2 - 6.5m max loaded height - towers



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FIGURE 1.8C

Port to Hay Transport Routes - Off-site Road Work Areas (Hay)



Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Hay

Port Adelaide Routes

- Route 1 - 5.2m max loaded height - blades, motors, general loads
- Route 2 - 6.5m max loaded height - towers

Port of Newcastle Routes

- Route 1 - 4.9m max loaded height - blades
- Route 2 - 6.1m max loaded height - towers
- Route 3 - 5.3m max loaded height - all remaining loads



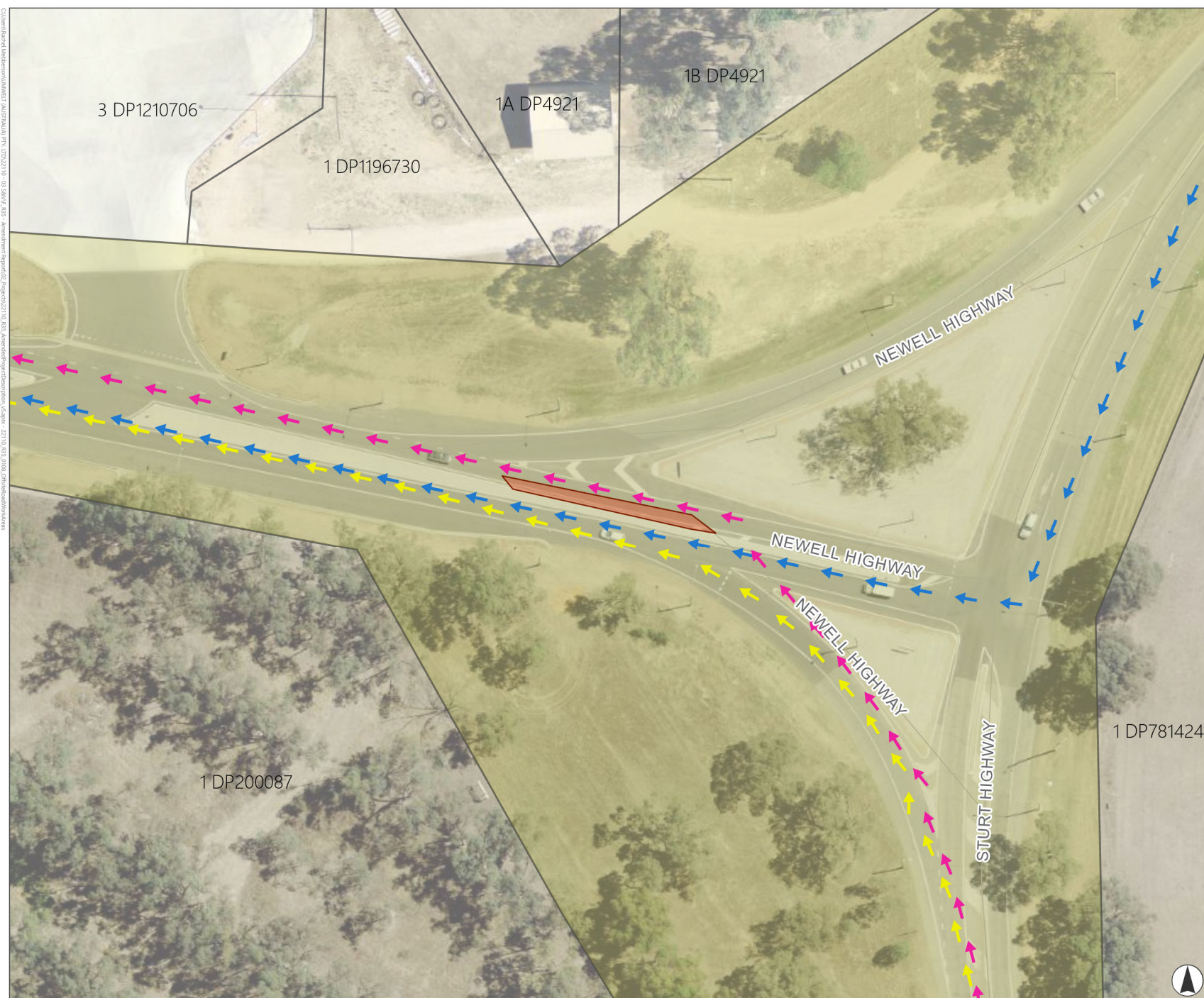
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FIGURE 1.8D

**Port to Hay Transport Routes -
Off-site Road Work Areas
(Gillenbah)**



Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Gillenbah

Port of Newcastle Routes

- ➔ Route 1 - 4.9m max loaded height - blades
- ➔ Route 2 - 6.1m max loaded height - towers
- ➔ Route 3 - 5.3m max loaded height - all remaining loads



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FIGURE 1.8E
 Port to Hay Transport Routes -
 Off-site Road Work Areas
 (Merriwa)



Legend

- Road
 - Lot/DP
 - NSW Road Corridor
 - Off-site Road Works Area - Merriwa
- Port of Newcastle Routes**
- ➔ Route 2 - 6.1m max loaded height - towers



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FIGURE 1.8F

Port to Hay Transport Routes - Off-site Road Work Areas (Narrandera)

Legend

- Road
- Lot/DP
- ▬ NSW Road Corridor
- ▭ Off-site Road Works Area - Narrandera

Port of Newcastle Routes

- ➔ Route 2 - 6.1m max loaded height - towers



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FIGURE 1.8G

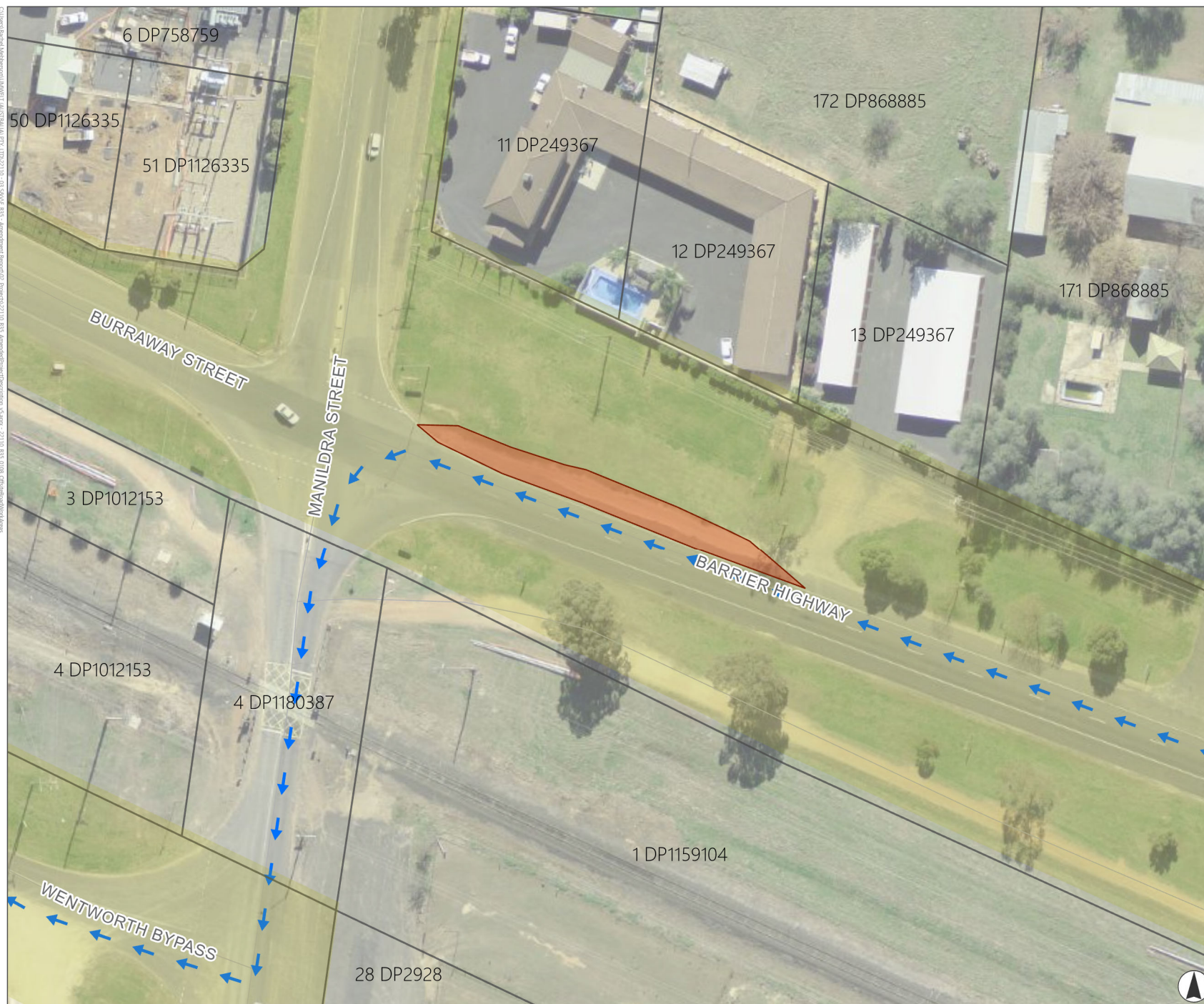
**Port to Hay Transport Routes -
Off-site Road Work Areas
(Narromine)**

Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Narromine

Port of Newcastle Routes

- ➔ Route 2 - 6.1m max loaded height - towers



Metres

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FIGURE 1.8H

Port to Hay Transport Routes -
Off-site Road Work Areas (Wagga
Wagga [1st Roundabout])

Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Wagga Wagga

Port of Newcastle Routes

- ➔ Route 1 - 4.9m max loaded height - blades
- ➔ Route 3 - 5.3m max loaded height - all remaining loads



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FIGURE 1.8J

Port to Hay Transport Routes -
Off-site Road Work Areas (Wagga
Wagga [3rd Roundabout])

Legend

- Road
- NSW Road Corridor
- Off-site Road Works Area - Wagga Wagga
- Port of Newcastle Routes**
- ➔ Route 1 - 4.9m max loaded height - blades
- ➔ Route 3 - 5.3m max loaded height - all remaining loads



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Scale 1:1,000 at A4
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FIGURE 1.8K

**Port to Hay Transport Routes -
Off-site Road Work Areas (Wagga
Wagga [4th Roundabout])**



Legend

- Road
- Lot/DP
- NSW Road Corridor
- Off-site Road Works Area - Wagga Wagga

Port of Newcastle Routes

- ➔ Route 1 - 4.9m max loaded height - blades
- ➔ Route 3 - 5.3m max loaded height - all remaining loads



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Client: Daniel Anderson | Umwelt (Australia) Pty Ltd | 22/03/2023 | 08:50 AM | 233 - Amendment Report | 10:03 | Amendment Report | 10:03 | Amendment Report | 10:03 | 22/03/2023 | 08:50 AM | 233 - Amendment Report | 10:03 | 22/03/2023 | 08:50 AM | 233 - Amendment Report | 10:03

1.3.9.3 Local Transport Route and Site Access

BWF has identified a Local Transport Route which will be utilised for all OSOM movements and the majority of light and heavy vehicle movements associated with the Project. The Local Transport Route extends from the intersection of the Cobb Highway and Jerilderie Road to the eastern-most site access point located on Northern Boundary Road, as shown on **Figure 1.9**.

The Route Study undertaken by RJA (refer [Appendix A of the Revised TIA, included as Appendix D of the Response to RFI#2](#)) identified the need for only very minor works along the Local Transport Route to accommodate Project traffic movements, based on the maximum proposed WTG dimensions for the Project (tip height of 300 m, a hub height of 200 m and a blade length of 100 m). These works will be undertaken as part of ‘off-site road works’ which form part of the Project.

These off-site road works are **described in Table 1.11 and include:**

- Proposed upgrades to the local transport route, including widening of the hardstand at the intersection of Cobb Highway and Jerilderie Road, widening of North Boundary Road and the maintenance and use of roadside parking areas along Jerilderie Road during the construction period, as shown on **Figure 1.9**.
- Establishment of 14 site access points, with 13 of these accommodating OSOM movements for incoming WTG components and one providing access to the proposed TWA at the locations shown in **Figure 1.10**. Each access will be gated and secured, and appropriate warning signs erected. [A temporary gravel treatment will be installed prior to the formalised construction of the access points to enable semi-trailer access onto site.](#)
- Ground disturbance, clearing/pruning of vegetation associated with the activities described above.

Table 1.11 Local Transport Route Off-Site Road Works

Location	Description of proposed road modification
Intersection of Jerilderie Road and Cobb Highway	Auxiliary Left-turn Treatment – Short Turn Lane (AUL(s)) including installation of hardstand on the inside corner. All proposed disturbance will be located within a total area of ~0.41 ha shown in Figure 1.9 . A strategic concept design for the intersection upgrade is provided in Appendix E of the Response to RFI#2.
North Boundary Road	Widening a 10 km long segment of North Boundary Road to a four (4) m wide carriageway, with one (1) m wide shoulders on both sides, plus additional disturbance for roadside drainage. All proposed disturbance will be located within the 19 m wide corridor shown in Figure 1.9 .
Road-side parking areas (Jerilderie Road)	Use of two (2) existing road-side parking areas on Jerilderie Road being approximately 0.2 ha and 0.3 ha as shown in Figure 1.9 .
Site access points (Jerilderie Road, North Boundary Road and Bullewah Road)	A total of 14 site access points as shown in Figure 1.10 .

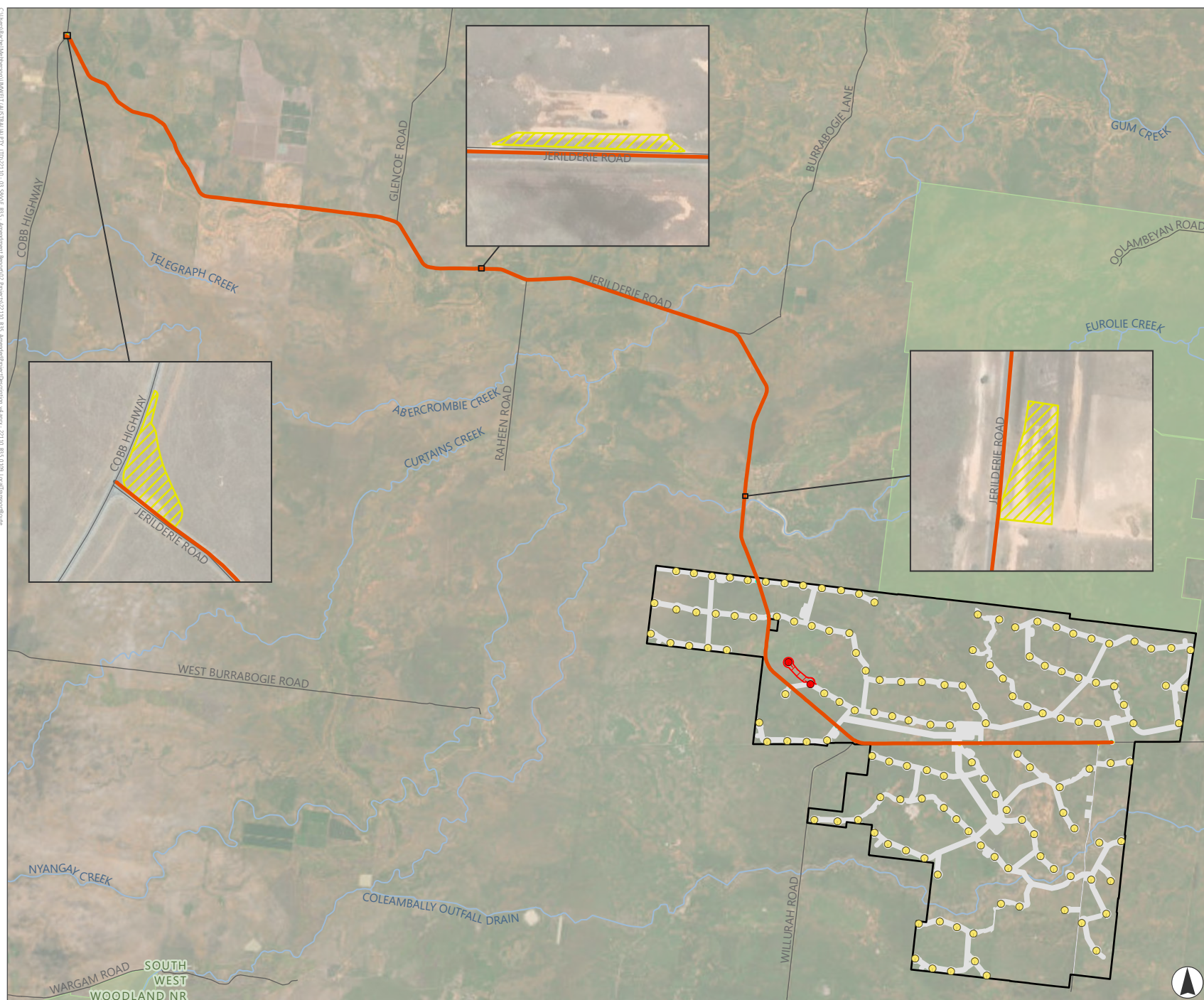
Each of the off-site road work area described in **Table 1.11** above were assessed in the Project EIS.

The proposed off-site road works will be undertaken in consultation with the relevant roads authorities, being TfNSW or the relevant Council and consent under Section 138 of the *Roads Act 1993* will be obtained as required prior to any works commencing.

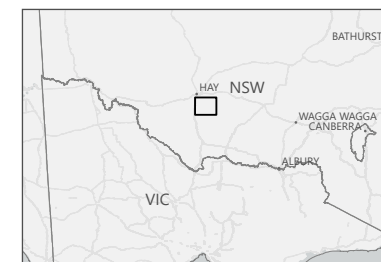
While the Local Transport Route will be utilised preferentially for all Project traffic, alternative local routes may be utilised in limited circumstances, namely:

- for the transport of quarried materials which cannot be sourced on site (refer to **Section 1.4.1**)
- for a small proportion of the construction workforce (approximately 9%), who are based locally and may travel to site from the south or east of the Project Area.

FIGURE 1.9
Local Transport Route



- Legend
- Project Boundary
 - Development Corridor
 - Stage 1 (South) Offsite Disturbance Footprint
 - Stage 2 (North) Offsite Disturbance Footprint
 - Wind Turbine Generators
 - NPWS Reserves
 - Road
 - Local Transport Route
- To Be Removed
- Wind Turbine Generators
 - Development Corridor
 - Disturbance Footprint



Kilometres
Scale 1:220,000 at A4
GDA2020 MGA Zone 55

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1.3.10 Obstacle Lighting

BWF has incorporated additional aviation safety features in response to advice from CASA and Airservices Australia on the Project EIS, and following a formal request for further information (RFI) from DPHI on 4 December 2024. This includes the provision of obstacle lighting on select WTGs and permanent meteorological masts (where masts are installed prior to WTG installation or are not in close proximity to a boundary WTG (>900 m)).

BWF has committed to install 200 candela medium-low intensity steady red obstacle lighting in accordance with the National Airports Safeguarding Framework Guideline D 'Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation' National Airports Safeguarding Framework Principles and Guidelines and section 9.31 of Part 139 Aerodromes Manual of Standards Part 139 (Aerodromes) Manual of Standards 2019.

Lighting of select WTGs and permanent meteorological masts (where required) is documented in the Amended Obstacle Lighting Plan (OLP), included as Appendix 12 of the Amendment Report. The Amended OLP conceptually illustrates the obstacle lighting proposed for the Project, noting that this is subject to change through detailed design of the Project, and following continued consultation with CASA.

1.4 Project Resources

1.4.1 Quarried Materials

While gravel will be sourced from the two (2) proposed on-site borrow pits where possible, importation of quarried materials including cement, gravel, aggregate and sand will be required for the construction of hardstands and WTG foundations and to support Project infrastructure including internal access roads, laydown areas and installation of electrical cabling.

To provide a worst-case assessment of traffic impacts, this Amendment Report has conservatively assumed that 100% of cement, gravel, aggregate and sand would be sourced externally from existing operating quarries. If this is not the case and suitable material of sufficient quantities is confirmed to be available within the proposed borrow pits, the number of trips generated would likely reduce significantly. Additionally, it is anticipated that excavation material will be recycled where suitable, which will reduce the estimated traffic volumes upon confirmed geotechnical testing and construction procurement.

It is anticipated that excavation material will be recycled where suitable, which will reduce the estimated traffic volumes upon confirmed geotechnical testing and construction procurement.

BWF has identified **eight (8)** regional quarry options to supply quarried material for Project construction. **Table 1.12** below provides details of the potential quarries, with quarry locations and transport routes shown in **Figure 1.11**.

Each of the identified quarries holds relevant approvals for the extraction, processing and transport of quarry products to the State road network, in some cases, subject to hourly or daily trucking limits as set out in **Section 5.3.2 of the Amended TIA (Appendix D of Response to RFI#2)**. All vehicle trips associated with the construction of the Project would be carried out within the respective limits of the quarry approvals (where applicable).

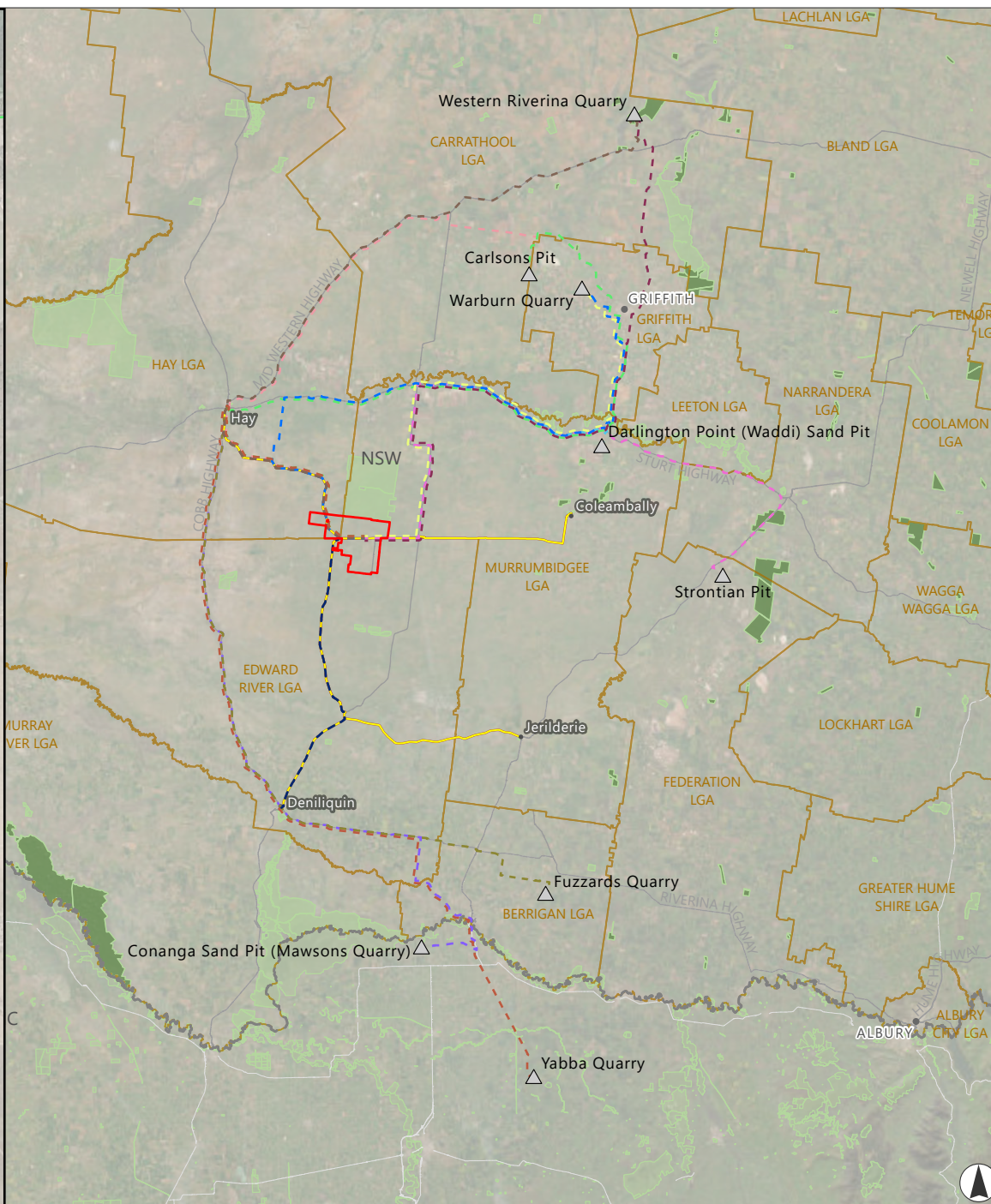
A comprehensive traffic impact assessment has then been undertaken within the Revised TIA for the remainder of the journey, from the State road network to the Project (refer to Appendix D of Response to RFI#2). As indicated in Figure 1.11 quarry trucks may approach the Project via the Local Transport Route (via the Cobb Highway and Jerilderie Road) to the north west, via Willurah Road to the south west, or via Conargo Road to the north east.

The preferred source and transport routes for quarried materials will be confirmed prior to the commencement of construction. Due to the cumulative demand for construction materials within the South West REZ, BWF is seeking flexibility to source quarried materials from alternative quarry locations or to utilise alternative routes than those identified in Table 1.12, or shown in Figure 1.11, as required, subject to all relevant State and local approvals being obtained by the relevant quarry operator for extraction, processing and transport.

Table 1.12 Regional Quarry Options Considered within the Amended Project

Quarry Name	Address	Resource
Western Riverina Quarry	439 Wiltshire Road, Rankins Springs, NSW	Hard rock
Warburn Quarry	Stevenson Road, Tharbogang, NSW	Hard rock
Carlons Pit	Lot 2, DP 1096699 Shaw Road, Tabbita, NSW	Hard rock
Strontian Pit	Strontian Road, Gillenbah, NSW	Sandstone, sand
Darlington Point (Waddi) Sand Pit	Jim Cattnach Rd (off Kidman Way), Darlington Point, NSW	Sand
Yabba Quarry	1942 Marungi Rd, Waggarandall VIC 3646	Hard rock
Fuzzards Quarry	Old Cobram, Berrigan Rd, Berrigan NSW 2712	Hard rock
Coonanga Sand Pit (Mawsons Quarry)	577 Bearii-Mywee Road, Strathmerton VIC	Sand

FIGURE 1.11
Indicative Light Vehicle and Quarry Transport Routes

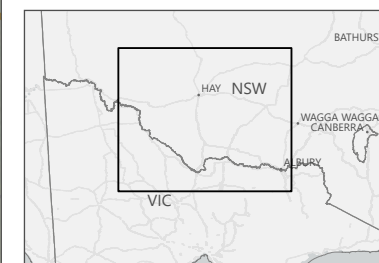


Legend

- △ Quarry
- Townships
- ▭ Project Boundary
- ▭ State Border
- ▭ NPWS Reserves
- ▭ State Forest
- Road
- Indicative Light Vehicle Routes for Construction Workforce

Indicative Regional Quarry Transport Routes

- - - Carlsons Pit A
- - - Carlsons Pit B
- - - Conanga Sand Pit
- - - Darlington Point Sand
- - - Fuzzards Quarry
- - - Strontian Pit
- - - Warburn Quarry A
- - - Warburn Quarry B
- - - Western Riverina Quarry A
- - - Western Riverina Quarry B
- - - Yabba Quarry
- - - Southern Quarries - Direct Route (Option B)



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1.4.2 Water Supply

The majority of raw/non-potable water required to meet Project water demands would be sourced on site from licensed groundwater bores under agreement with host landholders. Host landholders currently hold WALs permitting groundwater extraction in excess of 870 ML per year, or approximately 2.4 ML per day, which exceeds their current water usage requirements.

If required, supplementary raw/non-potable water sources may include:

- Groundwater from licenced bores under agreement with host or neighbouring landholders.
- Harvested runoff from disturbed areas captured in excavations or sediment basins/traps constructed to prevent sediment transport off-site.
- Recycling and reusing water.

The largest water demands, such as for dust suppression, soil conditioning, and asphalt and/or concrete batching, are all non-recoverable water uses. Water used for these activities would be captured, recycled and reused as far as practical.

Any water supplied to the Project from existing groundwater bores will be sourced under agreement with relevant landholders while ensuring any WALs, works approvals and water use approvals required under the *Water Management Act 2000* (WM Act) are obtained.

Potable water supply for construction, operation and decommissioning will be sourced from commercial suppliers in the nearby region and transported to the Project Area via tanker truck.

A site water balance for the Project is provided in Appendix 13 of the Project EIS. Further details regarding site water usage and water licensing requirements is provided in Section 6.9 and Appendix 13 of the Project EIS.

1.5 Commissioning

Pre-commissioning checks will be carried out on the high voltage electrical equipment prior to connection to the transmission network. When the Project's electrical system has been energised, the WTGs and battery storage will be commissioned and put into service. WTGs are commissioned sequentially enabling some WTGs to commence operation prior to the completion of wind farm construction. For the purposes of the EIS and subsequent Amendment Report the commissioning phase is considered to commence during construction and will end once the final WTG and electrical compound has been fully commissioned.

1.6 Operational Phase

Once operational, the Project would be monitored both by on-site staff and through remote monitoring. Aspects of the Project operation to be dealt with by on-site staff would include safety management, environmental condition monitoring, landowner management, routine servicing, malfunction rectification and site visits. Those functions to be overseen by remote monitoring include WTG and battery storage performance assessment, Project reporting, remote resetting and maintenance co-ordination.

Pro-active computer control systems will monitor the performance of the WTGs and battery storage so that any issues can be dealt with by on-site staff, as appropriate. Maintenance staff will be on-site throughout the year, making routine checks of the WTGs, battery storage and ancillary infrastructure on an ongoing basis. Major planned servicing would be carried out approximately twice a year on each WTG. Each major service visit would potentially involve a number of service vehicles on-site.

Replacement of major components, such as WTG blades, may require the use of cranes and ancillary equipment. Management of regrowth and existing vegetation will be necessary within the overhead transmission line corridors to reduce the threat of fire and physical damage to the transmission line, and to allow access for maintenance vehicles. Occasionally, access by medium and heavy vehicles may be required to repair or maintain overhead transmission line components.

1.7 Decommissioning Phase

The WTGs have an expected operating life of approximately 30 years and the agreements with the host landholders provide for the operations to continue past 30 years. At the end of that 30-year period, three (3) options will be considered:

- continued use of the Project Area as a wind farm and battery storage utilising the existing WTGs and other facilities (subject to contractual agreement with the host landholders and condition of equipment)
- replace the WTGs and battery storage with technology current at that time and continue the wind farm and battery storage operation for a further term (subject to contractual agreement with the host landholders and further development consent)
- decommission the wind farm and battery storage and remove the WTGs and other infrastructure.

Should decommissioning be required, key stakeholders including relevant landholders would be consulted regarding the decommissioning and rehabilitation plan. All costs associated with decommissioning will be borne by BWF or their representative.

All above ground structures not required for the ongoing agricultural use of the land, including the WTGs and substations will be removed and the land rehabilitated so that it can return to agricultural use. Internal roads, if not required for ongoing farming purposes or fire access, would be removed. Access gates, if not required for farming purposes, would also be removed. Host landholders will be involved in any discussion regarding the removal or hand-over of infrastructure on their properties. Below ground infrastructure, including WTG foundations, hardstands and some cabling may be left in situ and covered in clean fill material, with the land returned to near prior condition and use as far as practicable.

The decommissioning phase would require similar equipment and activities to the construction phase including mobile and heavy equipment (e.g. cranes, earthworks machinery, compressor and rock crusher). Prior to the commencement of decommissioning activities, BWF would prepare a detailed decommissioning plan in consultation with DPHI and the relevant Councils to guide the implementation of the decommissioning works.

A Decommissioning and Rehabilitation Strategy (DRS) (included as Appendix 4 of Appendix 15 of the Project EIS) has been prepared as a precursor to a latter Decommissioning and Rehabilitation Plan (DRP) that would be prepared and then updated at key milestones (as currently outlined in the DRS) over the life of the Project.

1.8 Re-powering

The EIS and subsequent Amendment Report have assessed only up to decommissioning and do not include repowering. After approximately 30 years of operation (or sooner if deemed economically viable) the Project may be repowered, utilising contemporary equipment. This would be subject to a subsequent project approval process.

1.9 Project Components That May Change

Although 141 WTGs are proposed, commercial considerations and technological advancements may lead to fewer than 141 WTGs being constructed and operated, at the discretion of BWF. All 141 WTG locations have been included in the EIS and subsequent Amendment Report in order to assess worst-case impacts and to allow the flexibility to determine the optimal project layout within the limits of the development consent, generally in accordance with the EIS and subsequent Amendment Report.

The proposed Project layout presented in the EIS and subsequent Amendment Report is a product of BWF's commitment to avoid environmental and social impacts and mitigate any remaining impacts to the maximum extent practicable.

If development consent is granted, preferred suppliers will be selected following a tender and contractor selection process. Any potential supplier will have unique requirements and specifications such as transport vehicle turning radii, access and exit gradients and crane requirements. The final design will only be known following selection of Project components and the completion of the detailed design by the construction contractor post-approval.

1.10 Micro-siting

WTGs, battery storage, ancillary infrastructure and temporary facilities will be micro-sited post approval during the optimisation, detailed design and construction phase programming. Final micro-siting may not occur until during the construction period, immediately prior to the activity or construction of that Project element. Any micro-siting will be undertaken to meet the following criteria:

The process of locating WTGs, battery storage, ancillary infrastructure and temporary infrastructure during detailed design without further approval, providing that:

- ground disturbance is wholly contained within the Development Corridor, with the exception of meteorological masts
- no WTG is moved more than 100 m from the relevant GPS coordinates listed in Appendix 3 of the Project EIS

- the revised location of the blade of a WTG is at least 50 m from the canopy of existing hollow-bearing trees; or where the proposed location of the blade of a WTG is already within 50 m of the canopy of existing hollow-bearing trees, the revised location is not any closer to the existing hollow-bearing trees
- permanent meteorological masts are installed within the Project Area at all times and within the Development Corridor where reasonable and feasible.

1.11 Environmental Management System

An Environmental Management Strategy (EMS) will be developed for the Project. Opportunities for continuous improvement will be implemented where practical. The EMS will be developed in general accordance with ISO14001 Environmental Management Systems and will include all required management plans, procedures and protocols required as per the Development Consent (if approved) or as required via a risk assessment process.

The EMS will integrate policy, procedures and processes for training of personnel, monitoring, summarising, and reporting of environmental performance information to internal and external stakeholders. It will guide the environmental management activities of the Project throughout construction, operation, maintenance and decommissioning. Environmental risks will be identified via a risk assessment process, and mitigation and/or management measures determined to avoid or minimise environmental impacts.

The EMS will describe measures to monitor and publicly report on environmental performance via the Project website and will generally include a summary of monitoring results in accordance with the Development Consent (if approved), all required approved management plans and programs.

