APPENDIX E – MITIGATION AND MANAGEMENT

MITIGATION AND MANAGEMENT MEASURES

Environmental Aspect	Mitigation Measure	EIS Section Reference
Development	■ Construct, operate, maintain and decommission the Winterbourne Wind Farm generally in accordance with the 'Project Description'.	Section 3
	■ Seek relevant approvals and post-approvals in accordance with **Section 4.3**.	Section 4.3
General	■ An Environmental Management Strategy (EMS) will be developed to guide proposed activities associated with the construction, operation and decommissioning and rehabilitation of the Project.	Section 7.6
Biodiversity	■ A Biodiversity Management Plan will be prepared in consultation with relevant regulators prior to construction. Measures that will be adopted within the BMP to minimise the impact on biodiversity are detailed in **Table 6-9**.	Section 6.1.5, Table 6-11
	■ A Bird and Bat Management Plan will be developed in consultation with relevant regulators.	Section 6.1.5
	■ For residual impacts that cannot be avoided or fully mitigated, offsets will be required to ensure no net loss of biodiversity.	Section 6.1.6
Noise	<u>Pre-construction noise assessment</u> ■ A pre-construction noise assessment will be made based on the final turbine selection, layout and turbine-specific sound power levels. ■ Operational noise monitoring will be carried out following commissioning of the Project to verify compliance with the noise criteria.	Section 6.2, Table 6-22
	<u>Update assessment as required</u> ■ The assessment of noise from the substations and BESS facility will be updated should the size of the BESS or substation transformer(s) be increased or if the actual sound power levels of the specified equipment are materially different from the information assumed in the NVIA.	
	<u>"Feasible and reasonable" noise control strategies</u> ■ Implement "feasible and reasonable" noise control strategies to minimise noise during construction as described in **Table 6-22**.	
	<u>Scheduling</u> ■ Construction works, including heavy vehicle movements into and out of the site, will generally restricted to the hours between 7.00 am and 6.00 pm Monday to Friday, and between 8.00 am and 6.00 pm on Saturdays. ■ Works conducted outside of these hours will be limited to activities as described in **Table 6-22** and will be carried out in accordance with the EMS and associated sub-plans prepared for the Project (i.e. Noise Management Plan).	

Environmental Aspect	Mitigation Measure	EIS Section Reference
	Location of fixed noise sources ■ Locate fixed noise sources such as crushing and screening plant, concrete batching plant, generators and compressors at the maximum practicable distance to the nearest dwellings, and where possible, use existing topography (or raw or processed materials) to block line of sight between the fixed noise source and the dwelling.	
	Acoustic screens ■ Provide acoustic screens or mounding for fixed crushing and screening plant and concrete batching plant wherever these noise sources are located within 2,400 m of a non-involved dwelling and where there is no intervening topography between the noise source and the non-involved dwelling, in accordance with the requirements described in **Table 6-22**.	
	Enclose generators and compressors ■ Provide proprietary acoustic enclosures for site compressors and generators located within 2,400 m of a non-involved dwelling as described in **Table 6-22**.	
	Alternative processes ■ Investigate and implement alternative processes where feasible and reasonable as described in **Table 6-22**.	
	Site management ■ Carry out site management as described in **Table 6-22**.	
	Equipment and vehicle management ■ Carry out equipment and vehicle management as described in **Table 6-22**.	
	Community consultation ■ Implement noise related elements into the overall community consultation process.	
	Traffic management ■ Care will be taken, particularly through towns and around site entry and exit points, to avoid excessive acceleration of trucks and the use of truck engine brakes in close proximity to dwellings and that such behaviour will be reinforced through worksite induction training.	
	Reduce construction traffic noise ■ In accordance with the general principles of dealing with temporary construction noise impacts as compared to permanent operational noise, where the NSW Road Noise Policy criteria are exceeded (during the peak construction period), the mitigation measures as described in **Table 6-22** will be employed to reduce construction traffic noise.	
	Construction vibration ■ If construction activities producing high levels of vibration occur within 100 m of a dwelling, such as upgrading existing roads (which may be within 25 m of the closest dwelling), a monitoring regime will be implemented during these times to ensure compliance with DECC 2006.	

Environmental Aspect	Mitigation Measure	EIS Section Reference
	<u>Blasting</u> ■ Given the range of factors associated with both the generation and control of blasting, in the event of blasting occurring, a monitoring regime will be implemented to ensure compliance with the Australian and New Zealand Environment Council (ANZEC) – *Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground* vibration (ANZECC, 1990).	
Landscape and Visual	<u>Project Layout and Design – Wind Farm Layout and Size</u> The following principles will guide the design process of the Project: ■ Controlling the location of different turbine types, densities, and layout geometry to minimise the visual impacts. ■ The lines of turbines will reflect the contours of the natural landscape as best as possible. ■ Ensure the turbines are evenly spaced to give a regular pattern creating a better balance within the landscape.	Section 6.3, Table 6-26
	<u>Project Layout and Design – Wind Turbine Design and Colouring</u> The turbines will have a light grey (RAL 7035) finish and consist of three blades. The following factors have been considered in the Project design to achieve a visual consistency through the landscape: ■ Uniformity in the colour, design, rotational speed, height, and rotor diameter. ■ The use of simple muted colours and non-reflective materials to reduce distant visibility and avoid drawing the eye. ■ Blades, nacelle, and tower to appear as the same colour. ■ Avoidance of unnecessary lighting, signage, logos.	
	<u>Screen Planting</u> ■ Visual screen planting is a beneficial mitigation method which will be used to assist in reducing the visual impact of the Project. In circumstances where residences are subject to a high level of visual impact, screen planting will assist in mitigating views of turbines from residential properties. ■ To achieve visual screening between the intrusive element and the residence, tree planting will be undertaken in consultation with the relevant landowners to ensure that desirable views are not inadvertently eroded or lost in the effort to mitigate views of the turbines.	
	<u>Residence Supplementary Planting</u> ■ Due to the vegetated character of areas surrounding the Project Area, the Project is likely to be fragmented or screened by vegetation from many dwellings. Where turbines are located close to the dwelling or existing vegetation is thin, the supplementary planting mitigation method will be employed to further reduce potential visibility and ensure longevity of the intervening vegetation.	
	<u>Onsite Mitigation Methods – Non-associated Dwellings</u> ■ Non-associated dwellings within 3,100 m: – Screen planting was identified as a potential mitigation for four (SR007; SR240; SR262; SR268).	

Environmental Aspect	Mitigation Measure	EIS Section Reference
	– Supplementary planting has been suggested for five (SR207; SR216; SR272; SR274; SR298). ■ Non-associated dwellings between 3,100 m – 4,550 m: – Screen planting was identified as a potential mitigation for six (SR075; SR087; SR088; SR092; SR117 SR359). – Supplementary planting has been suggested for five (SR006; SR050; SR093; SR289; SR350).	
	<u>Night Lighting – Aviation Hazards Lighting</u> To assist in the amelioration of the effect of Aviation Hazards Lighting, the following mitigation measures are proposed subject to CASA requirements: ■ If used, air navigation lights are required to be spaced over the array, particularly at the extremities. They are not required on every tower. Careful consideration will be given to the turbines upon which aviation lighting is installed to avoid unnecessary impact upon residences. ■ Treatment of the rear of blades with a non-reflective coating to reduce reflection off the rotating blade at night. ■ Use of the lowest candela intensity allowed by CASA. ■ According to the CASA requirements, shielding may be provided to restrict the downward spill of light to the ground plane by ensuring that no more than 5% of the nominal light intensity should be emitted at or below 5° below horizontal. ■ No light will be emitted at or below 10° below horizontal.	
	<u>Night Lighting – Ancillary Structures</u> ■ Security lighting throughout the wind farm, switching station and the substation will be minimised to decrease the contrast between the wind farm and the night-time landscape of the area. ■ Motion detectors will be used to activate night-time security lighting when required. ■ Lighting will be designed to ensure it does not spill onto nearby roads or residences.	
	<u>Ancillary Infrastructure – Transmission Lines</u> ■ Where possible underground cabling will to be used to connect WTGs to Project substations. ■ The route for any proposed overhead transmission lines will be chosen to reduce visibility from surrounding areas. ■ The route for any proposed overhead transmission lines will be chosen to minimise vegetation loss. ■ Subtle colours and a low reflectivity surface treatment will be used on power poles to ensure that glint is minimised.	

Environmental Aspect	Mitigation Measure	EIS Section Reference
	<u>Ancillary Infrastructure – Access Roads</u> ■ Where possible the Project will utilise or upgrade existing roads, trails, or tracks to provide access to the turbines to reduce the need for new roads. ■ Allow for the provision for downsizing roads or restoring roads to existing condition following construction where possible. ■ Any new roads will minimise cut and fill and avoid the loss of vegetation. ■ Utilise local materials where practical.	
	<u>Ancillary Infrastructure – Ancillary Structures</u> ■ Siting will consider minimising vegetation loss. ■ Screen planting will further reduce residual visual impacts. ■ Controlling the type and colour of building materials used with a recessive colour palette will to be used which blends into the existing landscape. ■ Unnecessary lighting, signage on fences, logos will be avoided. ■ Any proposed buildings will be sympathetic to existing architectural elements in the landscape. ■ Cut and fill, and loss of existing vegetation will be minimised throughout the construction process. ■ Boundary screen planting which will be utilised to ameliorate potential visual impacts resulting from the construction of ancillary structures with a small vertical scale such as collector substations, switching stations and the O&M building.	
Traffic	■ A Traffic Management Plan (TMP) will be prepared prior to construction. The contractor would be responsible for obtaining all required approvals and permits from TfNSW and local Councils and for complying with conditions specified in the approvals. The TMP will provide additional information regarding the traffic volumes and distribution of construction vehicles that is not available at this time, including: – Road transport volumes, distribution and vehicle types broken down into: ▪ Hours and days of construction. ▪ Schedule for phasing/staging of the Project. – The origin, destination, and routes for: ▪ Employee and contractor light traffic. ▪ Heavy vehicle traffic. ▪ Oversize and overmass traffic. ■ Measures that will be adopted within the TMP to minimise the impact of construction traffic along the road network are detailed in **Table 6-31**.	Section 6.4, Table 6-31

Environmental Aspect		Mitigation Measure	EIS Section Reference
Hazards and Risks	Aviation	<u>Designed air routes</u> ■ To accommodate the WTGs at 230 m AGL, engagement with the operators of air route W128 LSALT will occur to increase it by 200 ft from 5,900 ft to 6,100 ft AMSL.	Section 6.5.1, Table 6-34
		<u>Notification and reporting</u> ■ 'As constructed' details of WTGs including coordinates and elevations will be provided to Airservices Australia. ■ Department of Defence will be consulted if there is any subsequent modification in the WTG height or scale of development. ■ Any obstacles above 100 m AGL (including temporary construction equipment) will be reported to Airservices Australia NOTAM office until they are incorporated in published operational documents. ■ Details of the Project will be provided to local and regional aircraft operators prior to construction in order for them to consider the potential impact on their operations. Specifically, details will be provided to the NSW Regional Airspace and Procedures Advisory Committee for consideration by its members in relation to VFR transit routes in the vicinity of the wind farm. ■ To facilitate the flight planning of aerial application operators, upon request details of the Project (including location and height information of WTGs, met masts and overhead transmission lines) will be provided to landowners within Project Area so that, when asked for hazard information on their property, the landowner may provide the aerial application pilot with all relevant information.	
		<u>Aerial operations</u> ■ Engage with local aerial agricultural operators and aerial firefighting operators in developing procedures for such aircraft operations in the vicinity of the Project. ■ Engage with the operators of ALAs in close proximity to the wind farm to develop a mitigation plan. This may include suspending the relevant WTG's operation (dependent on wind direction and wind speed) for the period that the ALAs are in use for take-off and landing.	
		<u>Marking of turbines</u> ■ The rotor blades, nacelle and the supporting tower of the WTGs will be painted light grey (RAL 7035), typical of most WTGs operational in Australia. No additional marking measures are required for WTGs.	
		<u>Lighting of turbines</u> ■ The Project will not require obstacle lighting to maintain an acceptable level of safety to aircraft.	
		<u>Micrositing</u> ■ Micro-siting of the WTGs and met masts will occur within 100 m of assessed location. ■ The micro-siting of the WTGs and met masts is not likely to result in a change in the maximum overall blade tip height of the Project.	

Environmental Aspect		Mitigation Measure	EIS Section Reference
	Bushfire	■ A Bushfire Emergency Management and Operational Plan (BFEMOP) will be prepared in consultation with relevant stakeholders. The BFEMOP will outline appropriate management bushfire protection measures for the life of the Project.	Section 3 Section 6.5.2
		■ In the event of a fire, the AC circuit breaker in the substation will be closed remotely by operational staff. TransGrid will also be able to shut off the supply from outside the Project Area if required. WTGs are fitted with a variety of control systems, which can be activated in the event of extreme weather conditions (such a high wind speeds or high temperatures), localised fire, or overheating. WTGs can also be shut down if they exceed the tolerance of their design specifications. ■ Engage with FRNSW and NSW RFS to develop operational procedures for remote shutdown to allow for aerial firefighting over WTGs.	
		■ An APZ will be established at the respective location of work, at the appropriate time, prior to commencement of activities, and maintained for the life of that component. The APZs would be maintained to the standard of an IPA for the life of the development. ■ A 20 m bushfire APZ will surround the substation, switchyard, and BESS, as described in Section 3. ■ For other components described in Table 5.1 of Appendix K, an APZ no less than 10 m in width will be provided, thus providing a defendable space around key infrastructure and temporary construction facilities. Where forest / wooded vegetation is present adjacent to the infrastructure, an increased 20 m wide APZ will occur. ■ Table 5.1 of Appendix K further describes how the Project will comply with the APZ specifications contained in PBP 2019 (NSW RFS, 2019).	
		■ Landscaping will be considered throughout the design process and further enforced throughout the construction and operational phases of the Project. If landscaping or revegetation of areas within the Project Area are required, they will be located and designed to reduce the risk of flame contact and radiant heat to both Project infrastructure and other key assets.	
		■ Property access and internal access arrangements will comply with the specifications of Table 7.4a of PBP 2019 (or otherwise, the NSW RFS Fire Trail Standards (NSW RFS, 2016), to ensure access to the Project Area is suitable for emergency response vehicles.	
		■ In accordance with Table 5.3d of PBP 2019, a water supply no less than 20,000 L will be provided to improve property protection measures and/or to act as a static water supply for emergency services in consultation with NSW RFS.	
		■ Structures for the storage of essential equipment installed onsite will be non-combustible, or otherwise structures will incorporate basic ember protection measures.	
		■ Additional protection measures for the Project as listed in **Table 6-35** will be implemented.	

Environmental Aspect		Mitigation Measure	EIS Section Reference
	Blade Throw	■ IEC Standards as listed in **Section 10.3.4** will be used for the design and construction of the Project which will reinforce the confidence that blade throw will represent a very low risk. ■ Inspection and Testing Procedures will be initiated and audited during the construction and commissioning phase. Once testing finds all WTG components including the blades are passed, the WTG will be commissioned for operation. ■ Implement a high quality, comprehensive and robust operations and maintenance program to ensure that WTG faults are prevented or detected and rectified quickly, minimising the risk of occurrence of a serious or dangerous problem (refer **Section 10.3.4**).	Section 6.5.3
	SEPP 33 / Preliminary Hazard Analysis	■ Consult with FRNSW during detailed design of the facility to ensure that the relevant aspects of fire protection measures have been included. These may include: (i) type of firefighting or control medium (ii) demand, storage and containment measures for the medium. The above aspects will form an input to the Fire Safety Study which may be required as part of the development consent conditions, for review and approval by FRNSW. ■ Review the investigation reports for the 'Victorian Big Battery Fire' (occurred on 31 July 2021) and implement relevant findings for the Project. ■ A range of mitigation and management measures for each of the identified hazards and events will be implemented as discussed in the PHA (**Appendix M**) and summarised in **Section 6.5.4**.	Section 6.5.4
	Electromagnetic Interference	<u>Radiocommunication towers</u> The following mitigation hierarchy will be followed in consultation with the operators: ■ Technological "fix" (e.g. increasing the signal strength from the affected tower or alternative towers, or installing a signal repeater or additional tower on the opposite side of the Project Area.) to existing services will be progressed in preference to Project changes to minimise potential impacts. ■ If this does not result in minimal impacts, project changes may be employed including relocating WTGs to be further from the affected tower or removing WTGs from the Project.	Section 6.5.5, Table 6-41
		<u>Fixed point-to-point links</u> During detailed design, consultation with the operators will occur. If there is a potential for interference from the WTGs, the following mitigation hierarchy will be followed in consultation with the operators: ■ Technological fix: Upgrading the equipment for the affected link, rerouting the link via an existing or new tower, or replacing the link with an alternative communication technology. ■ Slightly relocate WTGs B154, B138, B139, and B152 as proposed by the Telco Authority and outlined in Section 4.2.2 of **Appendix N**. ■ Avoid interference to the point-to-point links operated by the NPWS and Walcha Council by moving WTGs outside of the diffraction exclusion zones established by DNV and shown in Figure 6 and Figure 7 of **Appendix N**. In consultation with NSW RFS, identify and rectify interference of NSW RFS point-to-point links after construction of the Project.	

Environmental Aspect	Mitigation Measure	EIS Section Reference
	■ No WTGs will be located within 600 m of BOM's point-to-point link which crosses the Project Area.	
	Fixed point-to-multipoint type ■ If interference is experienced after the Project is operational, mitigation options will be employed in consultation with the operator to resolve including: rerouting the links, installing additional towers, or replacing the affected links with alternative communications infrastructure.	
	Emergency services ■ Point-to-point links: As per mitigation for point-to-point links above. ■ Mobile telephony systems: If interference is experienced after the Project is operational, the Proponent will engage with the operator to: increase signal strength from affected tower or alternative towers, install signal repeater, and/or install additional tower. These mitigation measures also apply for mobile broadband services.	
	Meteorological radar ■ The BoM will be notified prior to any planning shutdown of the Project to allow calibration of systems. ■ The Proponent will collaborate with BoM in the event of severe weather conditions.	
	Satellite television and internet ■ If interference is experienced after the Project is operational, in consultation with the operator: redirect satellite dish to alternative satellite, install larger or higher quality satellite dish, change location or height of satellite dish.	
	Radio broadcasting If interference is experienced after the Project is operational, in consultation with the operator: ■ AM signals: install a higher quality antenna at affected location. ■ FM signals: install higher quality antenna at affected location, increase signal strength from affected tower, move tower to a new location, install signal repeater, install additional tower.	
	Television broadcasting If interference is experienced after the Project is operational, in consultation with the operator: ■ Realign the antenna at affected dwelling to existing tower. ■ Redirect antenna to alternative tower. ■ Install more directional or higher gain antenna. ■ Change location of antenna. ■ Install cable or satellite television. ■ Install relay transmitter.	

Environmental Aspect		Mitigation Measure	EIS Section Reference
	Human Health / EMF	■ The Project has been designed to implement prudent avoidance by incorporating significant setbacks between residential dwellings and Project components which will generate ELF EMF, as further detailed in **Section 6.5.6**.	Section 6.5.6
Aboriginal Heritage		<u>Aboriginal Cultural Heritage Management Plan</u> ■ An Aboriginal Cultural Heritage Management Plan (ACHMP) will be prepared prior to the commencement of construction as part of Environmental Management Strategy. – The ACHMP will detail measures to protect Aboriginal heritage sites, including temporary fencing, test excavations and salvage (if required), a strategy for the long-term management of any Aboriginal heritage items collected from the test excavations or salvage works, an unexpected finds procedure and other contingency and reporting procedures. – The fate of the artefacts salvaged under an approved ACHMP would be determined in consultation with the RAPs and the details provided in the ACHMP.	Section 6.6
		<u>Management and Mitigation of Recorded Aboriginal Sites</u> ■ The following management options will be adopted in terms of best practice and desired outcomes: – Avoid impact by altering the development project, or in this case, by avoiding impact to a recorded Aboriginal site. If this can be done, then a suitable curtilage around the site must be provided to ensure its protection both during the short-term construction phase of development and in the long-term use of the area. If plans are altered, care must be taken to ensure that impacts do not occur to areas not previously assessed. – If impact is unavoidable then approval to disturb sites under the authority of an ACHMP must be sought from DPE. ■ The following sites recorded during the OzArk survey will require the mitigation and management measures described in **Table 6-51**: Yalgoo IF-1; Bywell OS-2; Green Range OS-1; Green Range OS-3 with PAD; Table Top Rd IF-1; Woodburn IF-1; Tarwonga ST-1; The Ranch OS-1 with PAD; The Ranch IF-1; Queenlee OS-1 with PAD; Queenlee E-1; and Talisker ST-1.	
Historic Heritage		■ In consultation with DPE, a Historic Heritage Management Plan (HHMP) will be prepared prior to construction as part of Environmental Management Strategy. – The HHMP will detail measures to protect historic heritage sites and provide an unexpected finds procedure and other contingency and reporting procedures.	Section 6.7
Soils and Water		■ A Soil and Water Management Plan (SWMP) will be prepared prior to construction. The SWMP will be prepared by a suitably qualified person and be accompanied by Progressive Erosion and Sediment Control Plans (ESCP). ■ The SWMP and ESCP will include mitigation measures outlined in **Section 6.8.5**, including suitable measures to ensure activities associated with the Project do not impact on the integrity of the Oxley Wild Rivers National Park.	Section 6.8.5, Section 7.5

Environmental Aspect	Mitigation Measure	EIS Section Reference
Hydrology and Flooding	■ The SWMP as outlined above will include measures to manage additional runoff from the surface of the Project components (e.g. hardstands and access roads). ■ Detailed design of the cross-drainage structures located along the Project infrastructure will be required at the next stage of the Project to meet the local and road authorities' requirements.	Section 6.9
Air Quality	■ The EMS will include consideration of the management and mitigation of offsite dust emissions, and provide guidance on how those environmental management measures will be implemented. ■ Measures as described in **Section 6.10.4** will be included in the EMS to reduce visible dust emissions and will be implemented where appropriate.	Section 6.10
Waste	■ A Waste Management Plan (WMP) will be prepared to describe the measures to be implemented to manage, reuse, recycle and safely dispose of waste. Specific measures to be included in the WMP are described in **Section 6.11.4**. ■ Targeted management strategies for each waste type to be implemented will be undertaken as per **Table 6-68**.	Section 6.11
Socio Economic	■ Implement a Community Benefit Fund prior to construction, as described in **Section 3.12**.	Section 3.12
	■ Develop and implement a Procurement Policy prior to construction to maximise local employment, and regional business opportunities.	Section 6.12.5
	■ Develop and implement a 'Workforce Accommodation Strategy' prior to construction that manages impacts to local short and long-term accommodation arrangements in surrounding towns.	Section 6.12.5
	■ Develop and implement a 'Workforce Codes of Conduct' prior to construction, which apply to work sites.	Section 6.12.5