Appendix C

Compilation of mitigation measures

Figure C.1 Compilation of mitigation measures

No.	Outcome	Mitigation measure	Timing
Biodiversity			
B1	Protection of terrestrial ecology during construction of the project.	Prepare a flora and fauna management sub-plan prior to construction of the project.	Pre-construction
B2	Site workers made aware of the ecological values of the project site, protection measures to be implemented, and penalties for breaches during construction.	All workers are to be provided with an environmental induction prior to starting work on site. This would include information on the ecological values of the site, protection measures to be implemented to protect biodiversity and penalties for breaches.	Pre-construction
B3	Site workers made aware of areas to be protected during construction.	Prepare plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features, threatened plants and TECs in the vicinity of work areas and revegetation areas.	Pre construction Construction
B4	Avoidance of unnecessary vegetation and habitat removal and the transmission of weeds or disease.	Prior to the commencement of any work in or adjoining areas of native vegetation, a survey would be carried out to mark the construction impact boundary. The perimeter of this area would be fenced using high visibility fencing and clearly marked as the limits of clearing. All vegetation outside this fence line would be clearly delineated as an exclusion zone to avoid unnecessary vegetation and habitat removal and the transmission of weeds or disease. Fencing and signage would be maintained for the duration of the construction period. Fencing would be designed to allow fauna to exit the site during clearing activities.	Pre construction Construction
B5	Prevention of weed and pathogen spread and establishment	Wash and disinfect machinery entering the site prior to work on site to prevent the potential spread of weeds, Cinnamon Fungus and Myrtle Rust/Exotic Rust Fungi in accordance with the national best practice guidelines for Phytophthora (O'Gara *et al.* 2005), the Myrtle Rust factsheet (DPI 2015) for hygiene control and the NSW hygiene guidelines for wildlife (DPIE 2020d). Implement protocols to prevent the introduction or spread of chytrid fungus following the NSW hygiene guidelines for wildlife (DPIE 2020d).	Construction
B6	Protection of unexpected threatened species and inclusion in offset strategy, if required.	Prepare an unexpected finds protocol that details measures to be undertaken if threatened flora and fauna not previously recorded in the project site are detected during clearing or construction activities, or if additional occurrences of threatened species previously recorded in the broader area, but not previously recorded at a specific location, are recorded during clearing or construction activities. Include any unexpected finds in the offset strategy, as required.	Construction
B7	Protection of fauna and fauna habitat.	Protocols for the management of fauna and habitats would be included in the flora and fauna sub-plan. These would include (if required): – A procedure for the felling of hollow-bearing trees to prevent or minimise mortality of fauna. – Salvage of hollows and logs where practicable. – Temporary frog-proof fencing should be installed where required such as roadside drains and detention ponds near the project site to be retained to prevent frogs from being injured or killed by equipment. – Management of any trenches or drill sites to prevent fauna from becoming trapped or injured.	Construction

No.	Outcome	Mitigation measure	Timing
B8	Protection of fauna and fauna habitat.	Undertake pre-clearing surveys prior to construction by a suitably qualified ecologist. Ensure surveys and inspections, and any subsequent relocation of species, is undertaken in accordance issue-specific environmental management sub-plans. Include the following specific surveys: – Surveys for roosting microbats for any man-made structures to be removed. – Searches for nest trees in vegetation to be removed. – Identification of hollow-bearing trees and logs requiring fauna management during removal	Construction
Aboriginal and non-Aboriginal heritage			
H1	Protection of unexpected heritage objects/sites.	Implement cultural heritage awareness induction training for all personnel prior to commencing construction on-site.	Construction
H2	Protection of unexpected heritage objects/sites.	In the event of an unexpected archaeological/heritage item find during construction, works within the area would cease and a suitably qualified heritage professional would be engaged to assess the significance and management of the finds. An unanticipated discovery protocol would be implemented that details measures to be undertaken if heritage objects/sites not previously recorded in the project site are detected during clearing, ground disturbance, or construction activities. Example unanticipated discovery protocols are provided in Appendix J.	Construction
H3	Protection of unexpected skeletal remains.	In the unlikely event that human remains are discovered during construction, all works would cease in the immediate vicinity. The discovery would be reported to Enviroline, Heritage NSW, the local police, and the RAPs. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal. An unanticipated discovery protocol would be implemented that details measures to be undertaken if suspected human skeletal remains are detected during clearing, ground disturbance, or construction activities. Example unanticipated discovery protocols are provided in Appendix J.	Construction
Land			
L1	Further geotechnical testing	Further geotechnical testing and assessment would include consideration of a soil survey to determine whether any specific requirements are necessary to avoid potential erosion and scour.	Design
L2	Management of subsidence	A mine subsidence assessment would be undertaken to guide the future design with the intent that the serviceability of the battery and transmission structures are not compromised if a subsidence event occurs. Further consultation with Subsidence Advisory NSW in relation to subsidence risks and issues related to other continuing titles within the project site.	Design
L3	Site suitable for proposed use	Prior to construction occurring at the site, a statement by a NSW Site Auditor is to be provided by GPM indicating that the site is suitable for its intended use. The Site Audit Statement will detail the measures required to manage any residual contamination at the project site.	Design

No.	Outcome	Mitigation measure	Timing
L4	Contamination management subplan	Potential contamination-related impacts associated with the project will be managed by the implementation of a CEMP that includes (but not limited to): – Reference to and incorporation of any CEMP/OEMP controls or procedures for the site arising from the site Remediation Action Plan and Site audit Statement – Preparation of a spoil management plan including procedures for handling and storing contaminated and uncontaminated spoil in accordance with the *Protection of the Environment Operations (Waste) Regulation 2014* and protocols for undertaking appropriate sampling and analysis to support waste classification and tracking for any soil surplus – An unexpected finds protocol, including encountering asbestos containing materials and contaminated soils or groundwater during construction works Any PFAS containing materials considered for re use onsite should be assessed in accordance with PFAS NEMP 2.0 (HEPA 2020) and seek appropriate regulatory approvals for reuse.	Construction
Noise			
NV1	Site inductions	All employees, contractors and subcontractors will receive an environmental induction. The induction must at least include: – all noise and vibration mitigation measures – relevant licence and approval conditions – permissible hours of work – any limitations on high noise generating activities – location of nearest sensitive receivers – construction employee parking areas – designated loading/unloading areas and procedures – site opening/closing times (including deliveries) – environmental incident procedures.	Construction
NV2	Schedule activities to minimise noise impact	All activities on site will be confined between the hours of 7:00 am to 6:00 pm from Monday to Friday and 8:00 am to 1:00 pm on Saturday, with the exception of the following activities: – the delivery of oversized plant of structures – emergency work to avoid the loss of life or damage to property, or to prevent environmental harm	Pre-construction / Construction
NV3	Construction Noise and Vibration Sub Plan	A Construction Noise and Vibration Management Plan will be prepared as part of the CEMP and implemented during construction. The plan will detail processes, responsibilities and measures to manage noise and vibration and minimise the potential for impacts during construction. The Construction Environmental Management Plan CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.	Pre-construction / Construction
NV4	Out of hours works	An out of hours works procedure will be developed as part of the CEMP for the project if these works are required. This should include a detailed construction noise and vibration assessment for the potential construction activities proposed to occur out of hours. An out of hours works application form for any works outside of the approved working hours for the project will be required. A description of the works, justification and management measures would also be included as part of the application.	Pre-construction / Construction

No.	Outcome	Mitigation measure	Timing
NV5	Plant noise levels	The noise levels of plant and equipment should have an operating sound power lower or similar to the levels presented in Appendix G.	Pre-construction / Construction
NV6	Maintain equipment	Regularly inspect and maintain equipment to ensure it is in good working order. Also check the condition of mufflers. Equipment must not be operated until it is maintained or repaired, where maintenance or repair would address the annoying character of noise identified.	Construction
NV7	Equipment design	Battery supplier selection and the site layout would ensure project noise trigger levels outlined in Appendix G would not be exceeded at any sensitive receivers.	Detailed design / Pre-construction
NV8	Complaints handling	To address situations where noise emission levels are perceived by residents to be a problem, procedures will be developed for receiving, handling, responding to and reporting community complaints.	Operation
NV9	Noise monitoring qualifications	All attended noise monitoring is to be carried out by a suitably qualified noise specialist. Records of routine equipment calibration and testing are to be maintained by the qualified noise specialist undertaking the monitoring	During operation
NV10	Operational noise monitoring	Noise monitoring is to be carried out at commissioning and/or following the commencement of operations, inclusive of any staging of operations, when the battery is both operating in standby and discharge modes. Operational noise monitoring should be repeated following any major changes to battery configuration/ supplier or maintenance activities which is likely to have an impact on noise emissions.	During operation
Transport			
T1	Minimise impacts to traffic and transport networks.	Develop a construction traffic management sub-plan, prior to construction. Include, at a minimum, the following management measures: – Preparation of a Traffic Guidance Scheme, detailing adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised. – Preparation of a Traffic Guidance Scheme, detailing adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised. – Maintain accessibility for pedestrians and cyclists. – Indicate routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses. – Implement measures to manage traffic flows around the area affected by the construction of the project, including, as required, regulatory and direction signposting, line marking, and variable message signs and all other traffic control devices necessary for the implementation of the construction traffic management sub-plan. – Undertake consultation with the relevant road authorities during preparation of the sub-plan. Ensure the performance of project traffic arrangements is monitored during construction.	Pre-construction
T2	Minimise impacts to the operation of the Colongra Power Station	Ensure trucks used for the delivery of diesel to the Colongra Power Station are unimpeded.	Construction

No.	Outcome	Mitigation measure	Timing
T3	Minimise environmental impacts associated with the movement of vehicles.	Monitor the roads leading to and from the project site and take necessary steps to rectify any road deposits caused by site vehicles, to maintain the safety of road users. Where possible, offset the construction vehicle activity from peak periods of road network activity.	Construction
T4	Minimise environmental impacts associated with the movement of vehicles.	Induct employees and contractors to raise awareness and understanding of traffic and transport mitigation measures to be implemented during construction via the CEMP.	Construction
Water			
W1	Appropriate management of stormwater drainage to prevent flooding.	Review site hydrology and proposed stormwater drainage requirements to allow stormwater to be appropriately managed (quantity, velocity and quality) and in accordance with relevant requirements. This would include consideration of climate change impacts and the site's location relative to adjacent sensitive receivers. Consider opportunities for a dual-use stormwater system to manage risks to water quality during emergencies such as fire.	Design
W2	Appropriate management of water source(s).	Undertake a construction water balance and identify appropriate sources of water in the required quantities.	Pre-construction
W3	Impacts to surface water quality are eliminated/reduced.	Develop and implement a construction soil and water management sub-plan. Include a monitoring and maintenance program, an unexpected finds procedure, as well as a trigger action response plan.	Pre-construction, construction
W4	Impacts to surface water quality are eliminated/reduced.	Develop and implement a decommissioning and rehabilitation soil and water management sub-plan. Include a monitoring and maintenance program, an unexpected finds procedure, as well as a trigger action response plan. Risks should be re-assessed based on proposed activities following operation.	Decommissioning and rehabilitation
Hazards			
HR1	Eliminate/reduce risk of thermal runaway event	– Select lithium iron phosphate chemistry for the battery type. – Reassess risk of a thermal runaway event occurring once detailed design is confirmed and battery supplier is selected. – Subject to revised modelling using project specific information, the battery should be located at least 4.5 metres from the site boundary. – Design, install and operate the battery energy storage system in accordance with manufacturers requirements, relevant design codes and electrical standards, informed by recent battery incidents and in accordance with a project specific Battery Management Plan (see HR4) – Conduct of a fire safey study for the proposed design. – Install a dedicated fire suppression system in the unlikely event of a fire. – Consult with relevant authorities during design development including access provisions, levels of training, site fire facilities, etc.	Design
HR2	Eliminate/reduce risk of EMF exposure	– Design and selection of electrical equipment to adopt prudent avoidance principles – Install fit for purpose electrical systems. – Fence and sign all areas containing high voltage equipment e.g., switchyard to minimise risk of accidental entry by untrained personnel.	Design

No.	Outcome	Mitigation measure	Timing
HR3	Eliminate/reduce risk of construction/ decommissioning accidents	– Prepare a construction management plan, and when needed, a decommissioning plan, to manage construction/ decommissioning-related risks, including traffic management, designated pedestrian areas within the core development site and bushfire management. – Develop safe work method statements to guide construction/ decommissioning activities, including crane operation, installation of electrical equipment and chemical handling procedures. – Provide appropriate Personal Protective Equipment to all staff	Construction/ decommissioning
HR4	Eliminate/reduce risk of thermal runaway event	A Fire Safety Study developed and implemented in consultation with Fire + Rescue NSW and incorporated into a Battery Management Plan . The Fire Safety Study is to capture the key battery safety requirements outlined in relevant publications including Occupational Safety and Health Administration, 2019, Battery University, 2017 and Tesla, 2017. Key aspects of the plan should include: – Compliance with all manufacturers installation and operational requirements. – Quality certification for supply and installation activities. – Minimum battery container separation distances. – Minimum battery container separation distances. – Systems for monitoring, control and management of battery charging activities. – Inspection and maintenance requirements. – Emergency response and preparedness.	Commissioning /Operation
Bushfire			
BR1	Reduce potential bushfire radiant heat flux exposure of Waratah Super Battery assets to tolerable levels.	Implement a 25-metre-wide APZ along the western and southern side of the project site (no APZ required to east and north as no bushfire prone vegetation present within 100m), unless a performance-based solution adequately demonstrates that a smaller APZ would meet the aims and objectives of the Planning for Bushfire Protection guidelines.	Design
BR2	Provide appropriate access for fire appliances to facilitate Waratah Super Battery protection during bushfire.	Provide a vehicular access track around the Waratah Super Battery, consistent with access standards in Planning for Bushfire Protection (NSW RFS 2019).	Design
BR3	Bushfire emergency plans in place establishing preparedness and response arrangement for a bushfire emergency.	Prepare a ‘Bushfire Emergency Management and Evacuation Plan’ in accordance with the RFS document ‘A Guide to Developing a Bushfire Emergency Management and Evacuation Plan’ for the construction and operation phases of the project.	Construction and Operation
BR4	Waratah Super Battery bushfire prevention.	Establish a ‘hot works management system’ for both construction and operation phases to prevent accidental bushfire ignition from hot works on site.	Construction and Operation

No.	Outcome	Mitigation measure	Timing
Social and economic			
SE1	Implementation of ongoing, regular, and transparent communication with stakeholders	EnergyCo would continue to manage and deliver community and stakeholder engagement in the lead up to construction of the project. This would help to ensure that: – The community and stakeholders have a high level of awareness of all processes and activities. – The community and stakeholders are made aware of any potential disturbances and/or disruptions well in advance of them occurring. – Accurate and accessible information is made available. – A timely response is given to issues and concerns raised by the community. – Feedback from the community is encouraged. – Opportunities for input are provided.	Pre-construction
SE2	Ongoing community engagement during construction activities	A project-specific communication management plan would be developed by the service provider in accordance with the Community and Stakeholder Engagement Strategy and implemented to define the specific requirements for engagement during delivery of the project. This would be developed and implemented to ensure that residents and stakeholders are notified in a timely manner about works activities and potential for impacts, accurate information is accessible, and enquiries and complaints are managed in a timely manner. The plan would include approaches and protocols to: – Communication and notification with potentially affected residents and stakeholders about work activities and potential for impacts. – Communication accurate project information. Requirements for the complaints management system to be implemented throughout the duration of the project, including 24-hour, seven days a week phone line, postal and email address for written enquiries, and publication of contact details.	Construction
SE3	Non resident workforce accommodation	An accommodation strategy would be developed for the project to plan for the accommodation needs of any non-resident workers. The strategy would include: – Information to be shared by EnergyCo about workforce and accommodation requirements in a timely manner in line with the Community and Stakeholder Engagement Strategy. – plan for the responsible use of local accommodation in suburbs near to the site.	Construction
SE4	Local and Indigenous employment and procurement	EnergyCo would develop and implement an industry and Aboriginal participation plan in its contract with the service provider.	Construction
Waste			
WA1	Waste generation is minimised during construction.	Ensure that detailed design includes a focus on optimising earthworks to minimise excess spoil volumes and maximise the reuse of material on site. where practicable.	Design
WA2	Waste is classified and managed in accordance with regulatory requirements.	Classify waste in accordance with the Waste Classification Guidelines (NSW EPA 2014) and manage in accordance with the POEO Act and associated regulations.	Construction and operation

No.	Outcome	Mitigation measure	Timing
WA3	Construction waste is stored, segregated, handled, transported, and recovered or disposed of appropriately and in accordance with circular economy and waste hierarchy principles.	Prepare a construction waste management sub-plan prior to construction of the project. Adopt the circular economy principles and the waste hierarchy contained in the *Waste Avoidance and Resource Recovery Act 2001*. Detail processes, responsibilities, and measures to manage waste and resource use, and minimise the potential for impacts during construction.	Construction
WA4 WA4	Operational waste is stored, segregated, handled, transported, and recovered or disposed of appropriately and in accordance with circular economy and waste hierarchy principles.	Prepare an operation waste management sub-plan prior to operation of the project. Adopt the circular economy principles and the waste hierarchy contained in the *Waste Avoidance and Resource Recovery Act 2001* including a commitment to recycle batteries as far as practical. Detail processes, responsibilities, and measures to manage waste and resource use and minimise the potential for impacts during operation.	Operation
WA5 WA5	Decommissioning and rehabilitation waste is stored, segregated, handled, transported, and recovered/recycled or disposed of appropriately and in accordance with circular economy and waste hierarchy principles.	Prepare a decommissioning and rehabilitation waste management sub-plan prior to closure of the project. Include details on all relevant legislative and regulatory requirements and details of the proposed waste classification, demolition waste stockpiling, storage, handling and reuse, recycling, and disposal requirements. Also include an updated investigation of opportunities and feasibility of recycling of batteries. Undertake a detailed examination of battery life and investigate opportunities and feasibility of recycling spent batteries prior to operations commencing if not able to be returned to the manufacturer or supplier.	Operation, decommissioning and rehabilitation
Air quality			
AQ1	Dust emissions are minimised during construction.	Prepare a construction dust control protocol that details management measures, a method for recording dust complaints, and monitoring requirements.	Pre-construction
AQ2	Dust emissions are minimised during construction.	On days with forecast and actual high winds (i.e., over 10 m/s), reduce work effort accordingly if wind-blown dust is observed to be leaving the site boundary.	Construction
AQ3	Dust emissions are minimised during construction.	Undertake dust suppression, as required, using water sprays, water extension agents, soil stabilising polymers or other media on: – Unpaved work areas subject to traffic or wind. – Spoil and aggregate stockpiles. – During the loading and unloading of dust generating materials. – Unpaved access tracks.	Construction
AQ4	Dust emissions are minimised during construction.	If the works are creating levels of dust which may significantly impact on public amenity, modify or stop the works until the dust hazard is reduced to an acceptable level.	Construction
AQ5	Ignition risk, spills, and air emissions are minimised during construction and operation.	Maintain plant and equipment in good condition to minimise ignition risk of fuel or chemicals, spills, and air emissions that may cause nuisance.	Construction and operation