

20.0 Project Commitments

20.1 Introduction and approach

This summary of mitigation and management measures was developed to provide advice on the environmental management measures to be considered and included during the design, construction, and operation of the Project. Mitigation and management measures to be applied during the decommissioning phase of the Project will be provided in a decommissioning and rehabilitation plan prior to the end of the Project's operational period.

This chapter uses information about the existing environment, potential impacts, and proposed mitigation measures from the corresponding sections within this EIS, relating to:

- Noise and Vibration
- Landscape and Visual
- Shadow Flicker
- Electromagnetic Interference
- Aviation
- Hazard and Risk
- Socio-Economics
- Land Use and Planning
- Flora and Fauna
- Traffic and Transport
- Surface Water and Groundwater
- Topography, Geology and Soils
- Waste Management
- Cultural Heritage
- Sustainability and Climate Change.

The summary of mitigation and management measures has been structured to highlight approaches to prevent, mitigate, and monitor potential impacts during the design, construction, and operational phases. This information can then be reviewed and adopted at each phase of the Project. These mitigation and management measures will be further refined during the detailed design stage of the Project so that site and location-specific issues are captured and fully relevant to the final design of the Project. It will be at this stage that a detailed CEMP can be prepared to manage the potential impacts associated with the construction phase.

The CEMP is anticipated to include the following:

- Responsibilities
- Compliance obligations
- Training and competencies
- Monitoring and auditing
- Incident management
- Reporting.

Responsibilities associated with mitigation and management measures rest with the Project proponent, and other organisations involved with each Project stage, including design consultants and EPC contractor. Each person engaged to work on the Project, during any phase, will be required to comply with the CEMP. To this end, an environmental induction program will be necessary to ensure all site workers (involved in construction or operation) are inducted into the CEMP program prior to their commencement of duties.

Section 1: Noise and Vibration

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Noise and vibration	Noise and vibration impacts at residential dwellings	Compliance with Queensland Wind Farm State Code and Planning Guideline	Prevention	<p>Ensure that any wind turbine layout within the Project Site is compliant with the applicable noise criteria</p> <p>Use of low-noise plant and equipment model.</p>	<p>Preparation of a CEMP</p> <p>Scheduling of construction activities</p> <p>Maintenance of construction equipment</p> <p>Use of low-impact construction methods, where practicable</p> <p>Appropriate consultation with surrounding community about scheduling of construction activities</p> <p>Regular community consultation regarding noise created by the Project</p> <p>Limitation of construction hours to Monday to Saturday where practicable.</p>	N/A
			Contingency Measures	N/A	<p>Prepare a noise complaints procedure and register, and investigate any construction noise complaints appropriately.</p> <p>Vibration complaints are not expected, but will be appropriately investigated.</p>	Investigate any operational noise complaints appropriately

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			Monitoring	N/A	Noise monitoring in accordance with the CEMP	Undertake compliance noise measurements at sensitive receivers located in proximity to the Project to ensure compliance with the Queensland Wind Farm State Code and supporting Planning Guidelines

Section 2: Landscape and Visual

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Visual Amenity	Reduced visual amenity	No complaints relating to loss of visual amenity	Prevention	<p>Minimise vegetation removal, where possible</p> <p>Design of facilities to minimise visual impact on surrounds, such as semi-matt finishes on turbines to reduce glint</p> <p>Natural line of the existing landscape will be used wherever practicable</p>	<p>Limit works compounds and restrict to areas of lower visual sensitivity and/or lesser visibility where possible to avoid unnecessary visual impact</p> <p>Control after-dark construction lighting to minimise effects on sensitive visual receptors</p> <p>Use of spoil from excavation sites for incorporation into bunding for buffer planting zones</p>	Maintain access roads in a tidy manner
			Contingency Measures	<p>Use the natural line of the landscape to reduce visibility and assist integration of the wind farm infrastructure</p> <p>Wind turbines should be white or off-white, with a semi-matt surface to reduce the reflection of light</p>	<p>Construct overhead electrical reticulation below the ridgeline, where possible</p> <p>Consider new native planting to assist in visual screen, where necessary</p> <p>Ensure the screening consists of mixed plants of local provenance including some fast-growing species, as appropriate to the landscape character</p> <p>CEMP to control landscape and visual effects</p> <p>Site waste management plan will be enacted to ensure waste is minimised and reduces impacts to landscape character</p>	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			Monitoring	N/A	<p>Weekly visual inspection of construction areas for new infestations of weeds</p> <p>Weekly inspections of weed treatment areas to determine efficacy of measures</p>	<p>Regular visual inspections of rehabilitation areas for 12 months or until established for weed invasion</p> <p>Inspection of the Project Site during scheduled maintenance for weed infestation</p> <p>A post-decommissioning rehabilitation plan will be prepared to reinstate the Project Site to its pre-existing (or enhanced) conditions</p>

Section 3: Shadow Flicker

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Shadow Flicker	Shadow flicker experienced at dwellings and causing nuisance	No exceedance of guideline limits for shadow flicker at non-participating sensitive receptors.	Prevention	<p>Detailed design to be informed by further shadow flicker modelling if turbine layout is altered</p> <p>Site visit to investigate the dwellings expected to experience some shadow flicker to determine site-specific conditions. This will enable further modelling of the detailed design layout to incorporate site conditions at these locations, and will identify the need for mitigation measures at these locations</p> <p>Relocate turbines if shadow flicker impacts are determined to be extreme and unable to be mitigated through other means</p>	N/A	If determined to be necessary, implement control strategies to shut down certain turbines when shadow flicker is likely to occur at particular dwellings.
			Contingency Measures	N/A	N/A	<p>Enable landowners with concerns about shadow flicker to contact the wind farm operator. Any complaints to be investigated appropriately.</p> <p>Install screening structures or plant trees to block shadows cast by turbines during operation, where required.</p>
			Monitoring	N/A	N/A	N/A

Section 4: Electromagnetic Interference

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Electromagnetic Interference	Disruption to RFID operations in proximity to the wind farm	No EMI impacts or disruption	Prevention	N/A	N/A	N/A
			Contingency Measures	N/A	N/A	Establish a feedback process whereby stakeholders can raise concerns about EMI impacts with the wind farm operator. Investigate these complaints appropriately.
			Monitoring	N/A	N/A	N/A
	Disruption to CB radio and mobile phone signals	Minimal temporary disruption to signals	Prevention	Educate landowners and stakeholders about potential interference to CB radio and mobile phone signals	N/A	N/A
			Contingency Measures	N/A	Encourage CB radio and mobile phone users to move a short distance when experiencing signal interference.	Encourage CB radio and mobile phone users to move a short distance when experiencing signal interference.
			Monitoring	N/A	N/A	N/A
	Disruption to satellite and digital TV reception	No satellite or digital TV reception interference	Prevention	Ensure that any changes during detailed design to the wind farm layout are investigated for potential disruption to satellite or digital television		Educate residents experiencing interference issues on how to tune household antennas to alternative sources.

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			Contingency Measures	N/A	Establish a feedback process whereby stakeholders can raise concerns about EMI impacts with AGL. Investigate complaints accordingly and where mitigation measures are necessary, consider undertaking one or more of the following: Tune the householder's antenna into alternative sources of the same or suitable TV signal Install a more directional and/or higher gain antenna at the affected dwelling Relocate the antenna to a less-affected position Install satellite TV at the affected dwelling Install a TV relay station	Establish a feedback process whereby stakeholders can raise concerns about EMI impacts with the wind farm operator. Investigate these complaints appropriately and employ the appropriate mitigation measures as necessary
			Monitoring	N/A	N/A	N/A

Section 5: Aviation

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Airspace	Increased risk of collisions by aircraft with wind turbines or meteorological masts	No increase to risk profile	Prevention	<p>Consultation with appropriate authorities, including CASA, Airservices Australia, RAAF, AAAA, GFA and Hang Gliding Federation of Australia regarding the Project</p> <p>Liaise with RAAF about the low-level operations in the region, and the implications that this may have on the Project.</p>	<p>Notify Airservices Australia, CASA and RAAF when construction commences.</p> <p>Have the Project included on aeronautical charts.</p>	Wind farm operator to provide avenues for consultation with aviation stakeholders if any issues arise during the operation of the Project with respect to aviation-related factors.
			Contingency Measures	Consider inclusion of obstacle lighting on wind turbines if they penetrate navigable airspace in accordance with International Civil Aviation Organisation requirements.	Operate obstacle lighting in accordance with International Civil Aviation Organisation requirements if required.	Operate obstacle lighting in accordance with International Civil Aviation Organisation requirements if required.
			Monitoring	N/A	N/A	N/A

Section 6: Hazard and Risk

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Bushfire	Increase in prevalence and severity of bushfires	Reduced bushfire risk in the Study Area	Prevention	<p>Preparation of a Bushfire Management Plan in consultation with the QFRS</p> <p>Keep electricity services underground where possible (e.g. between turbines)</p> <p>Equipment and machinery (including the turbines) to provide high safety standards</p> <p>Develop emergency provisions for property owners neighbouring and containing wind turbines</p> <p>The Queensland Department of Community Safety (DCS) will be consulted prior to construction of the Project. The Project detailed design will be in accordance with relevant standards, including requirements for emergency vehicle access.</p>	<p>Maintain fire breaks around construction site</p> <p>Visual inspection of construction areas for presence of dry fuel</p> <p>Incorporate Bushfire Risk Plan into the CEMP</p> <p>Avoid higher risk areas when siting buildings or other infrastructure</p> <p>Ensure buildings meet specifications and requirements of AS 3959</p> <p>Install lightning protection devices in wind turbines</p> <p>Observe fire warnings and notices</p> <p>Fit buildings with fire detection systems in accordance with AS1670</p> <p>Maintain fire extinguishers at site offices and construction vehicles</p>	<p>Observe fire warnings and notices</p> <p>Maintain vegetation to remove any potential forest fuels</p>

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			Contingency Measures Provide suitable ingress and egress to the Project Site and escape routes Roads should be designed to carry fully-loaded fire fighting vehicles Ensure appropriate water supply	Prepare and implement an Emergency Response Plan for construction Investigate the cause of any fire, and update facilities or procedures to prevent further incidents Fire Danger Index (FDI) will be monitored daily.	Prepare and implement an Emergency Response Plan for operation Investigate the cause of any fire, and update facilities or procedures to prevent further incidents	
			Monitoring	N/A	N/A	Maintenance of vegetation to remove forest fuels Fuel management strategy to mitigate fire hazards, including planned fuel reduction burns Regular maintenance and servicing of equipment and turbines

Section 7: Socio-Economic Environment

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Social Impact	Noise exceedances at residents surrounding the wind farm due to operational noise impacts	Compliance with all applicable noise criteria	Prevention	Final turbine layout within the Project Site is to ensure compliance with operational noise criteria Application of operational noise criteria and setbacks from sensitive receptors	N/A	N/A
			Contingency Measures	N/A	N/A	N/A
			Monitoring	N/A	N/A	Undertake compliance noise measurements at sensitive receivers located in proximity to the Project to ensure compliance with the Queensland Wind Farm State Code and supporting Planning Guidelines
	Missed opportunities in relation to local employment and use of local contractors	Maximise local employment and contractor opportunities	Prevention	Early engagement with the community to increase awareness of employment opportunities for the construction and operation of the wind farm	Use of local contractors wherever feasible for all associated construction work Maximise local employment during construction phase	Maximise local employment during operational phase
			Contingency Measures	N/A	N/A	N/A
			Monitoring	N/A	N/A	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
	Reduced safety within the area Nuisance impacts associated with operation	No reduction in safety characteristics of the area No nuisance impacts	Prevention	Ensure that the final turbine layout is compliant with noise guidelines, shadow flicker guidelines and minimises EMI impacts and bushfire risk	CEMP to control noise and bushfire risk appropriately	Implementation of a Bushfire Management Plan
			Contingency Measures	N/A	Implement a complaint recording, investigation and reporting system for construction Investigate source of complaint and address the issue appropriately	Implement a complaint recording, investigation and reporting system for operation Investigate source of complaint and address the issue appropriately
			Monitoring	N/A	N/A	Undertake compliance noise measurements at sensitive receivers located in proximity to the Project to ensure compliance with the Queensland Wind Farm State Code and supporting Planning Guidelines.

Section 8: Land Use and Planning

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Land Use and Planning	Loss of Good Quality Agricultural Land Disruption to agricultural practices	Minimal reduction in rural production or output caused by construction or operation of the wind farm	Prevention	Consult with landowners to determine methods to prevent disruption to current agricultural practices Avoid areas of GQAL where possible	Develop and implement a CEMP, outlining how disruption of agricultural practices will be minimised during construction, based on discussions with landowners during the design phase	Operate the wind farm in accordance with measures identified during the design phase
			Contingency Measures	Where some disruption cannot be avoided, consult with landowners to identify ways to minimise impacts to agricultural practices	Where disruption cannot be avoided, liaise with landowners to reduce potential impacts Investigate the cause of complaints of disrupted activities and address the issue appropriately	Investigate the cause of complaints of disrupted activities and address the issue appropriately Implement a complaint recording, investigation and reporting system for construction and operation
			Monitoring	No monitoring required	No monitoring required	No monitoring required

Section 9: Flora and Fauna

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Flora Conservation	Direct loss of endangered Semi-Evergreen Vine Thicket (SEVT) vegetation community	Compliance with the EPBC Act, NC Act, VM Act, and EP Act Maintain the current extent of endangered SEVT vegetation community	Prevention	Avoid all SEVT for wind turbines and other infrastructure unless there is no suitable alternative Co-locate access roads and underground electrical reticulation to reduce area of vegetation clearing required	Minimise construction activities within remnant vegetation Locate all construction sites, such as site office, soil stockpiles, machinery/ equipment storage within existing cleared areas or disturbed area Impose strict no-go zones for construction workers and machinery within endangered vegetation Micro-siting will be used to minimise impacts on the areas of remnant vegetation and regrowth vegetation.	N/A
			Contingency Measures	Prior to clearing, collection of seeds from local trees for propagation and use in seed mixes	All vegetation to be removed is clearly marked and clearing contractors briefed on clearing requirements Educate all contractors on the importance of the vegetation and ensure no encroachment on surrounding vegetation Implement the SEVT management and rehabilitation plan in accordance with the SEVT Recovery Plan (McDonald, 2007).	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			Monitoring	N/A	Daily visual inspection of vegetation clearing boundaries	N/A
Flora Conservation	Direct loss of 'Of Concern' Regional Ecosystem	Compliance with the EPBC Act, NC Act, VM Act, and EP Act Maintain the current extent of 'Of Concern' vegetation communities	Prevention	Avoid all Of Concern RE unless there is no suitable alternative Detailed design of the Project to promote the retention of remnant vegetation within the Study Area Co-locate infrastructure to reduce area of vegetation clearing required	Minimise construction activities within remnant vegetation Locate all construction sites, such as site office, soil stockpiles, machinery/ equipment storage within existing cleared areas or disturbed area Impose strict no-go zones for construction workers and machinery within remnant vegetation	N/A
			Contingency Measures	Research viability of compensatory planting Develop a management and rehabilitation plan	All vegetation to be removed is clearly marked and clearing contractors briefed on clearing requirements Educate all contractors on the importance of the vegetation and ensure no encroachment on surrounding vegetation Implement the management and rehabilitation plan	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			Monitoring	N/A	Daily visual inspection of vegetation clearing boundaries	N/A
Flora Conservation	Direct loss of regrowth vegetation	Compliance with the EPBC Act, NC Act, VM Act, and EP Act Maintain the current extent of regrowth vegetation	Prevention	Avoid all regrowth vegetation unless there is no suitable alternative Detailed design of the Project to promote the retention of regrowth vegetation within the Study Area Co-locate infrastructure to reduce area of vegetation clearing required	Minimise construction activities within regrowth vegetation Locate all construction sites, such as site office, soil stockpiles, machinery/ equipment storage within existing cleared areas or disturbed area Impose strict no-go zones for construction workers and machinery within regrowth vegetation	N/A
			Contingency Measures	Research viability of compensatory planting Develop a management and rehabilitation plan	All vegetation to be removed is clearly marked and clearing contractors briefed on clearing requirements Educate all contractors on the importance of the vegetation and ensure no encroachment on surrounding vegetation Implement the management and rehabilitation plan	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			Monitoring	N/A	Daily visual inspection of vegetation clearing boundaries	N/A
Flora Conservation	Degradation of vegetation communities and habitats through indirect impacts, including edge effects, spread of weeds, introduced pests, modified surface water drainage, light and noise intrusion	Compliance with the EPBC Act, NC Act, VM Act, and EP Act No new infestations of weeds or pests attributable to the Project	Prevention	Avoid further fragmentation of existing small patches (<5 ha) Maintain, as far as practicable, existing surface drainage paths	Minimise construction activities within remnant vegetation Install washdown facilities at main site entry/exit points to remove soil and weeds Develop and implement a Weed Management Plan that includes specific controls for environmental and noxious weeds \	Revegetate disturbed areas as soon as practicable after works with appropriate native and locally endemic species that have high habitat value
			Contingency Measures	N/A	Maintain activities as set out in the Weed Management Plan	Maintain activities as set out in the Weed Management Plan
			Monitoring	N/A	Imported topsoils/mulches to be weed-free prior to material arriving onsite Visual inspections in accordance with the requirements set out in the Weed Management Plan	Visual inspections in accordance with the requirements set out in the Weed Management Plan
Flora Conservation	Removal of prescribed environmental matters that are regulated vegetation communities	Compliance with SP Act, VM Act and Environmental Offsets Act 2014	Contingency Measures	Determination of offsets (if required) Confirmation on delivery of offsets Delivery of financial offset (if appropriate)		

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Fauna Conservation	Mortality of native fauna	No significant impact on a native fauna population directly attributable to the Project	Prevention	Avoid the removal of large hollow-bearing trees or dead trees wherever possible	<p>Speed limits will be clearly signed on access roads and roads during construction and known fauna crossing points highlighted with signage</p> <p>Avoid travelling on roads during dusk and dawn, where possible.</p> <p>Removal and translocation of hollows containing wildlife from habitat trees shall be conducted using a cherry picker, arborist and spotter/catcher</p> <p>All nests and dreys shall be safely removed from trees prior to any trees being felled</p> <p>All native fauna are protected (including snakes) and shall not be intentionally harmed as a result of the works or workers actions</p> <p>All site personnel shall be made aware of sensitive fauna/habitat areas and the requirements for the protection of these areas</p>	Maintenance of fauna exclusion systems and structures designed for safe fauna passage to enable these systems to function effectively

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
					<p>Fauna exclusion devices shall be implemented where practical to discourage fauna from entering the construction site</p> <p>In accordance with statutory obligations/policies, construction activities to be monitored in accordance with a standardised Flora and Fauna Monitoring Program</p> <p>Avoid disturbing, removing or breaking up fallen timber (especially larger logs) wherever possible</p> <p>Wherever it is unavoidable to disturb fallen timber, relocate them adjacent to the turbine footprint or road</p>	
			Contingency Measures	N/A	<p>Investigate the cause of any fauna injury or death</p> <p>Information gained through investigations to be applied in adaptive management to prevent or minimise further losses or injuries where possible and practical and/or implement compensatory actions</p>	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			<p>Monitoring</p>	<p>Develop a pre-construction and post-construction monitoring plan for bats and birds</p>	<p>Prepare a Flora and Fauna Monitoring Program that includes assessment of mortality of native fauna and adaptive management processes to prevent or minimise further losses or injuries and/or identifies measures to be implemented as compensatory actions</p> <p>Visual inspections in accordance with the Flora and Fauna Monitoring Program</p>	<p>Continued visual inspection of Project Site for fauna mortality in conjunction with scheduled maintenance works and according to the requirements established in the Flora and Fauna Monitoring Program</p> <p>Flora and Fauna Monitoring Program to include targeted monitoring of bats and birds</p> <p>Records of all mortalities should be kept to ensure that mortality rates are kept to an acceptable level</p>

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Fauna Conservation	Impediment to movement of at risk wildlife (birds and bats) through natural wildlife corridors, particularly when travelling between Diamondy State Forest and Bunya Mountains National Park	Compliance with the EPBC Act, NC Act, VM Act, and EP Act	Prevention	Any turbine lighting is to be minimised, and red lights used to prevent the attraction of insects	Where possible, construction, and clearing of vegetation, should be staged to allow for continued wildlife movement outside the immediate danger of the construction site All construction activities, e.g. site offices, stockpiles etc should be located in existing disturbed or cleared areas to minimise disruption of wildlife habitat In accordance with statutory obligations, spotter/catchers will be present at all vegetation clearing to ensure minimal disturbance to onsite fauna and recover and rescue any injured or orphaned fauna during construction	N/A
			Contingency Measures	N/A	In accordance with statutory obligations, spotter/catchers will be present at all vegetation clearing to ensure minimal disturbance to onsite fauna and recover and rescue any injured or orphaned fauna during construction	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
			Monitoring	N/A	Visual inspections in accordance with the Flora and Fauna Monitoring Program	Continued visual inspection of wind farm for fauna mortality in conjunction with scheduled maintenance works and according to the requirements established in the Flora and Fauna Monitoring Program with input from QPWS

Section 10: Traffic

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Traffic Impact	Delays to traffic on SCRs and local roads	Manage increased traffic volumes appropriately	Prevention	Preparation of a Road Use Management Plan or Traffic Management Plan in consultation with TMR, SBRC and WDRC Investigate opportunities to use alternative routes for deliveries avoiding school bus routes and populated areas	Implementation of the Road Use Management Plan or Traffic Management Plan for construction traffic	Implementation of the Road Use Management Plan or Traffic Management Plan for operational traffic
			Contingency Measures	Specific traffic planning elements to be considered will include road diversions, construction route options and scheduling of deliveries, services and shift patterns	Any necessary road closures will be described within the Road Use Management Plan or Traffic Management Plan and necessary approval obtained from TMR and Councils Access points to be located with adequate sight lines and advance warning signs provided	N/A
			Monitoring	N/A	N/A	N/A
Stock Routes	Disruptions to stock movement along a stock route	No stock movement disruptions along stock routes	Prevention	Investigate detailed design solutions to minimise impact on existing roads and stock routes.	Ensure all stock routes remain open during construction phase, and any works or improvements to the road infrastructure must consider potential stock movement	Ensure all stock routes remain open throughout the operational period where possible
			Contingency Measures	N/A	N/A	N/A
			Monitoring	N/A	N/A	N/A

Section 11: Surface Water, Riparian Areas and Groundwater

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Water Quality	Sediment from disturbed areas may enter nearby waterways	Compliance with current State and Commonwealth legislation	Prevention	N/A	Develop and implement of a Sediment and Erosion Control Plan in accordance with Engineers Australia's <i>Soil Erosion and Sediment Guidelines for Queensland Construction Sites</i>	Maintain vegetation along easements to prevent soil erosion.
		Compliance with current State and Commonwealth guidelines, strategies and standards			Works within riparian zones to be scheduled outside the wetter months (November–February) as far as practicably possible	
		No visible evidence of sediment leaving construction sites	Contingency Measures	N/A	Maintain, repair or reinstate damaged erosion and sediment control infrastructure	Implement erosion and sediment control measures if areas are causing high sediment loads or turbidity in nearby waterways
		No visible increase in turbidity attributable to construction or operation of the wind farm	Monitoring	No background monitoring required	Daily visual inspections of sediment control infrastructure	N/A
					Weekly visual inspections of discharge water and receiving water bodies	
					Visual inspections of discharge water and receiving water bodies after rainfall	
					Turbidity monitoring in the event of turbid plumes from construction activities	

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Riparian Zone	Physical damage or alteration to riparian areas	No net degradation of riparian areas attributable to construction or operation	Prevention	Design to avoid structures within riparian areas where practicable Design to include rehabilitation of riparian areas Design to minimise scour and erosion of riparian areas CEMP to clarify guidelines on construction activities around riparian areas in the project construction zone.	Minimise vegetation removal and construction activities within waterways Rehabilitate riparian areas as soon as practicable after construction.	N/A
			Contingency Measures	N/A	Rehabilitate disturbed areas	If vegetation in rehabilitation areas dies due to the operation of the Project, investigate and address the cause and rehabilitate.
			Monitoring	No background monitoring required	Daily visual inspection of construction site for clearing or construction activities beyond designated areas Weekly visual inspection of rehabilitated areas until construction period is complete	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Riparian Zone	Interference with stream flow	No interference with stream flow attributable to construction or operation	Prevention	<p>Design to avoid construction within riparian areas where practicable</p> <p>Assess construction water supply requirements as part of design</p> <p>Department of Agriculture and Fisheries self-assessable codes for low-impact development activities will be used to design waterway barrier developments within the Project Site during construction.</p>	Obtain construction water from sources other than local waterways	Obtain water for irrigation of revegetated areas from a source other than local waterways
			Contingency Measures	N/A	<p>Cease abstraction of water from local waterways</p> <p>Acquire construction water from an alternative source</p>	<p>Cease abstraction of water from local waterways</p> <p>Acquire construction water from an alternative source</p>
			Monitoring	N/A	N/A	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Riparian Zones	Introduction of weeds and pests	No introduction of weeds or pests into riparian areas	Prevention	Design to avoid construction within riparian areas where practicable Design to include rehabilitation of riparian areas to prevent establishment of new weed and pest species	Develop and implement a Weed and Pest Control Plan, detailing procedures for cleaning and checking construction vehicles entering the construction site Minimise vegetation removal and construction activities within waterways Rehabilitate riparian areas as soon as practicable after construction	Maintain vegetation within the Project Site to prevent the establishment of weed species
			Contingency Measures	N/A	Manually remove weed species within and adjacent construction areas Remove overabundant or notifiable pest species in accordance with advice from the Department of Agriculture and Fisheries	Manually remove weed species within and adjacent to wind farm infrastructure in riparian areas
			Monitoring	No background monitoring required	Weekly visual inspection of construction areas for new infestations of weeds or pests Weekly inspections of weed or pest treatment areas to determine efficacy of measures	Inspection of Project Site during maintenance activities for weed infestation
Groundwater	Degradation of groundwater resource	No significant variation to local groundwater levels due to construction No contamination of	Prevention	Determine water requirements for construction and identify suitable water sources Identify surface water	Comply with Emergency Spill Containment Plan in the event of a spillage/leak of potentially hazardous substances Contain poor quality discharge water	No specific mitigation measures are considered necessary due to low potential risk

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
		local groundwater system		bodies sensitive to groundwater movement (i.e. dams) Identify all local users of groundwater resources within a 1 km radius of the Study Area	and treat prior to disposal, subject to achieving water quality guidelines	
			Contingency Measures	N/A	Investigate the nature of any spilled/leaked potentially hazardous/contaminating substances Investigate the extent of any spillage/leakage of potentially hazardous/contaminating substances	N/A
			Monitoring	N/A	Gauge daily groundwater levels in nearby privately owned (with permission) and registered bore holes Should groundwater quality in the immediate vicinity degrade as a result of the Project's construction activities, monitor down-gradient groundwater quality and downstream surface water quality	Conduct groundwater quality sampling, using the existing registered bore hole network, following a major spillage/leakage event All chemicals, fuel and oil will be stored in above ground tanks in bunded areas, with accurate records maintained of volumes purchased and stored, to ensure any contamination of land or water is prevented, and any spill is detected quickly.

Section 12: Topography, Geology and Soils

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Topography, Geology & Soils	Erosion	Effective erosion and sediment control measures implemented and maintained	Prevention	Incorporation of stable embankments and cuts, with catch drains to minimise longer term erosion	<p>Prepare and maintain a project-specific Erosion and Sediment Control Plan</p> <p>Keep land clearance to a minimum</p> <p>Avoid wherever possible clearing areas of highly erodible soils which are prone to water and wind erosion</p> <p>Where appropriate, revegetate and mulch progressively as each section of works is completed. The interval between clearing and revegetation should be kept to an absolute minimum</p> <p>Coordinate work schedules, if more than one contractor is working on a site, so that there are no delays in construction activities resulting in disturbed land remaining destabilised</p> <p>Program construction activities so that the area of exposed soil is minimised during times of the year when the potential for erosion is high, for example during Summer when intense rainstorms are common</p>	No specific mitigation measures are considered necessary due to low potential risk

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
					<p>Stabilise the site and install and maintain erosion controls in accordance with the project-specific Erosion and Sediment Control Plan</p> <p>Keep vehicles to well-defined access roads, and keep access roads off sloping terrain wherever practical</p>	
			Contingency Measures	N/A	<p>Identify and investigate the site of erosion and address in accordance with the project-specific Erosion and Sediment Control Plan</p> <p>Maintenance of road surfaces and cleared footprints will be conducted prior to and immediately following rainfall events during the construction phase and throughout the life of the Project, reducing the potential of mass movement of sediment.</p>	<p>Identify and investigate the site of erosion and provide suitable erosion controls, in accordance with the Erosion and Sediment Control Plan</p> <p>A land rehabilitation program will be established progressively, to reinstate a suitable soil profile.</p>
			Monitoring	No background sampling required	<p>Erosion and sediment control measures documented</p> <p>Daily visual inspection and check sheets maintained</p> <p>In-situ turbidity (NTU) monitoring of local receiving surface waters, in accordance</p>	N/A

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
					with the requirements of the project-specific Erosion and Sediment Control Plan	
Topography, Geology & Soils	Mass Wasting	No mass wasting/landslip events.	Prevention	<p>Geological and geotechnical investigations in areas requiring cuts – areas for turbine foundations and hardstand, and access roads.</p> <p>Geological profile of slopes, with slope stability reports issued prior to undertaking earthworks</p> <p>Incorporate rock bolting, retaining walls and stable cuts with associated catch drains as required to maintain slope stability</p>	Construction activities undertaken in accordance with relevant work method statements	Visual inspection of susceptible areas following heavy rainfall/landslip inducing event
			Contingency Measures	N/A	Identify and investigate the site of mass wasting and provide suitable remediation	Identify and investigate the site of mass wasting and provide suitable remediation
			Monitoring	No background sampling required	Mass wasting and landslip control measures documented	No background sampling required

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
					Daily visual inspection and check sheets maintained	
Topography, Geology & Soils	Generation of Acidic Material	No generation of acidic waste water No generation of acidic material	Prevention	Inspection of intrusive igneous rock bodies for disseminated sulphides will be conducted as part of the geotechnical investigation	Any exposed acid producing material will need to be neutralized and contained according to the <i>Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines</i>	No specific mitigation measures are considered necessary due to low potential risk
			Contingency Measures	N/A	Divert potentially acidic surface run-off away from local waterways, into established sedimentation basins Neutralise the contained surface run-off by chemical/biological means, in accordance with the <i>Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines</i>	N/A
			Monitoring	No background sampling required	Submission of samples of suspected acidic material to a NATA accredited laboratory for characterisation pH monitoring of surface run-off generated from operational construction sites, at times and in locations where generation of acidic runoff is likely	No background sampling required

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
					pH monitoring of local surface waters receiving surface run-off from construction sites, at times and in locations where generation of acidic runoff is likely	
Contaminated Land	Land contamination by on-site construction activities or by export of contaminated material from site or importation of contaminated material	No contamination of land	Prevention	Investigate the presence of any Notifiable Activities on properties within the Study Area An Emergency Spill Containment Plan to be produced	Nature, quantity and location of all hazardous materials on-site recorded in a manifest Storage areas to consist of a compacted base, bunding to contain spillages and roofing to prevent contamination and infiltration of stormwater (as per AS1940 and AS3780) Residual hazardous materials will be removed from the construction site and returned to an appropriate storage area or a suitable waste facility Spillages of all dangerous goods and contaminated materials will be rendered harmless through investigation, collection and disposal at a suitable disposal facility Fill material imported from off-site to be procured from a licensed quarrying facility and accompanied by relevant	The application of good practice in the storage and handling of dangerous and hazardous goods will provide appropriate practical responses to manage impacts on occupational health and safety and minimise the risk of a spill occurring

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
					documentation to verify it is contaminant/ASS free Contaminated fill material exported from site will be disposed at a facility licensed for disposal of such material	
			Contingency Measures	N/A	If potentially contaminated soils are encountered, a preliminary site investigation should be undertaken Visual and olfactory observation of all in-situ material excavated during construction	Preliminary site investigation of land exposed to leaked or spilled potentially hazardous substances/material
			Monitoring	No background sampling required	Submission of samples of suspected contaminated material to a NATA accredited laboratory for characterisation	Submission of samples of suspected contaminated material, generated from operational activities, to a NATA accredited laboratory for characterisation

Section 13: Waste Management

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Waste	Excessive waste generation	Minimal waste generation	Prevention	Detailed design for infrastructure to carefully specify material needs to avoid over estimating requirements.	AGL will use a hierarchical approach to waste management, from the most preferable (reduce, reuse or recycle wastes) to the least preferable (disposal), and prioritise waste management strategies to avoid waste generation.	The waste stream generated from a wind farm during operation is minimal. AGL will use a hierarchical approach to waste management during operation.
			Contingency Measures	N/A	Where waste cannot be avoided, waste materials will be segregated by type for collection and removal (for processing or disposal) by licensed contractors.	Where waste cannot be avoided, waste materials will be segregated by type for collection and removal (for processing or disposal) by licensed contractors.

Section 14: Cultural Heritage

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Cultural Heritage	Disturbance of items of cultural heritage	Minimal reduction of cultural heritage values	Prevention	Establish a dialogue between AGL and Traditional Owners Development of a Cultural Heritage Management Plan	Include construction phase within the Cultural Heritage Management Plan	Include operation phase within the Cultural Heritage Management Plan
			Contingency Measures	N/A	If items of potential cultural heritage significance are discovered during construction, work is to cease immediately in the vicinity of the construction works and a cultural heritage professional is to be invited to investigate prior to works recommencing in that area Cultural Heritage Management Plan to potentially include recommendations for Traditional Owners on site during construction activities	Investigate any heritage-related complaints and address accordingly Implement a complaint recording, investigation and reporting system for construction and operation
			Monitoring	N/A	N/A	Visual inspection of items of cultural heritage value in the event of a complaint

Section 15: Sustainability and Climate Change

Environmental Factor	Potential Impact	Target	Management Objective			
				Design	Construction	Operation
Sustainability and Climate Change	Increased global temperature due to increased energy usage	Reduce carbon footprint of the Project	Prevention	Energy efficient lighting to be used, whilst satisfying the safety requirements of the Project Use of sustainably sourced or recycled materials for temporary structures and drainage where possible	N/A	N/A
			Contingency Measures	N/A	Water efficiencies used wherever available, including minimising potable water during construction, and using construction waste water for dust suppression Avoidance of clearing vegetation where possible	N/A
			Monitoring	N/A	N/A	N/A