Appendix C Mitigation Measures Summary Table

A wide range of mitigation measures to prevent or minimise environmental impacts that may be generated by the Proposal have been detailed throughout this EIS. This section compiles those considered necessary to minimise impacts and maximise positive outcomes on the physical, social and economic environments of the local area and wider region.

The recommended mitigation measures and strategies will be implemented and managed so that the Proposal complies with statutory obligations under EPA licenses and approvals. This includes environmental management and cleaner production principles in the planning, design, establishment, and operation of the Proposal.

By incorporating appropriate environmental management measures into the design of the Project and the contractual arrangements associated with the proposed works, the potential for adverse impacts on the environment will be eliminated and/or minimised.

The table below summarises the mitigation measures and strategies identified in this EIS to minimise impacts and safeguard the environment so that the desired environmental outcomes are achieved for the design, construction and operation of the Proposal. Implementation of these measures will ensure the Proposal minimises or eliminates potential impacts on the physical, social and economic environments of the local area and wider region.

Table C1. Mitigation measures summary table.

Issue	No	Mitigation Strategy
General	G1	A Construction Environmental Management Plan (CEMP) will be prepared to manage construction activity. The CEMP will include, as a minimum, industry-standard measures for the management of soil and water, noise and vibration, air quality, traffic, weeds and pollutants, biodiversity, and environmental monitoring for protection of neighbouring properties.
General	G2	An Operational Environmental Management Plan will be prepared to manage the operational aspects of Facility in relation to the mitigation measures as provided in the EIS. The OEMP will include, as a minimum, industry-standard measures for the management of community complaints, soil and water, noise and vibration, air quality, traffic, weeds and pollutants, biodiversity and environmental monitoring for protection of neighbouring properties during operation of the facility.
Community and Social	SI1	Prepare a Community Engagement Plan (CEP). The CEP is to include a process to carry out regular and ongoing engagement with Council, residents, and businesses in the LGA, providing them with timely, accurate, relevant and accessible information about construction and operation as relevant.
	SI2	Maintain a community complaints telephone line and online contact methods, advertised via the project website, for the purpose of receiving community complaints, or enquiries. The complaints register will include: • the date and time of the complaint; • the method by which engagement was made; • any personal details provided or, if no such details were provided, a note to that effect; • the nature of the complaint; and • any actions (if any required) taken in relation to the complaint. Investigations into complaints will commence within 24 hours of receipt, or as soon as practical with justification for the delay logged in the complaints register. The cause of the complaint will be analysed and actions to attempt to address the complaint taken as soon as reasonably possible. Complainants will be contacted with a resolution within 48 hours. In complex cases where resolution will take more than 48 hours, Verdant will contact them within 48 hours and commit to a timeframe for updating the community member (which will be logged in the register).
	SI3	Verdant will establish a Community Consultative Committee to foster dialogue between Verdant, the community, and key stakeholders regarding the Project. Convened by an independent chair, it will contain representatives of Singleton Council, NSW EPA, Verdant Earth, and two community representatives approved by Council. The committee is to consider any impacts which the power plant may have on residences and the local environment as a result of its operations.
	SI4	Verdant will undertake monthly environmental monitoring of the site (including noise and air quality) and publicise the results on the Verdant Earth website for review by the community.
	SI5	Verdant will develop and implement a Local Content Plan (LCP) to encourage local business participation in project procurement. The LCP should align with the Australian Government's Australian Industry Participation Plan. Wherever possible, Project supply and workforce requirements will be matched with existing capabilities in the LGA. Verdant will develop, and regularly update, a register of local businesses which will be notified about relevant Project procurement opportunities.

Issue	No	Mitigation Strategy
		Verdant will participate in LGA industry events to engage stakeholders and local businesses. Verdant will develop and implement an IPP for the Project in consultation with the relevant stakeholders. A register of Indigenous businesses will be maintained. Appropriate training and development programs will be outlined to support increased Indigenous participation.
	SI6	Verdant will develop and implement a Recruitment and Training Strategy (RTS) to encourage a higher rate of local labour force participation, or the in-migration of new hires to the LGA. This strategy would include engagement with key training providers (e.g., TAFE) in the aim of further defining and improving available training resources and capacity in the provision of apprenticeships, training programs and skill development opportunities The strategy will: • Demonstrate how the construction phase workforce accommodation demand will be monitored. • Demonstrate how workforce accommodation requirements will be managed during periods of high demand. • Enable the coordinated placement of the workforce in tourism accommodation throughout the LGA in a way that coexists with tourism sector demand.
Waste	WM1	A Specific Resource Recovery Order and Exemption for ash derived from the use of Domestic Biomass Fuel (DBF) will be sought prior to the use of DBF (and eligible waste fuel that does not meet the requirements of the Ash Order 2014).
	WM2	Waste management and minimisation will form part of the both the demolition/construction and operational induction programs (which includes environmental due diligence training). All Project and site personnel, and contractors will be trained in the requirements of this document including minimising wastes, recognising which types of materials are recyclable and their obligations to use recycling facilities provided on site.
	WM3	Clearly assign and communicate responsibilities to ensure that those involved in demolition/construction are aware of their responsibilities in relation to the Site Waste Minimisation and Management Plan.
	WM4	Engage and educate personnel on how the various elements of the Site Waste Minimisation and Management Plan will be implemented.
	WM5	Specific locations for waste management (e.g. sorting area locations, recycling bin locations, material stockpile locations) will be established on site and signposted appropriately.
	WM6	Waste management areas will be managed to prevent sediment runoff and dust generation.
	WM7	Construction Method Statements (CMS) will include practices to minimise waste generation and to maximise recycling and reuse of materials including oils, greases, lubricants, timber, glass, and metal.
	WM8	Packaging minimisation and reuse initiatives will be implemented as part of procurement.
	WM9	An unexpected finds environmental procedure will be developed in case any contamination should be found during construction works.

Issue	No	Mitigation Strategy
	WM10	Spill kits to be established on site in the case any fuel leaks should occur from plant and equipment during the construction phase of the development.
	WM11	Segregated waste disposal containers will be provided onsite for the collection and recycling/disposal of all waste streams generated during the demolition/construction and operation phases. Waste disposal containers will have clear signage and instructions for use to avoid cross-contamination. No rubbish shall be disposed of on site.
	WM12	Waste will be disposed to an appropriate licensed facility. A Waste Management Register of all waste collected for disposal and / recycling, including amounts, date and time, and details and location of disposal will be maintained at all times.
	WM13	Ensure that all ash generated from the combustion of biomass is tested and meets the requirements of The Ash From Burning Biomass Order 2014 and is used as a fertiliser in forestry or agriculture in accordance with The Ash From Burning Biomass Exemption 2014.
	WM14	Should the plant used coal tailings, ensure that all ash generated from the combustion of coal tailings is tested and meets the requirements of The Coal Ash Order 2014 and is used as a fertiliser or fill material in accordance with The Coal Ash Exemption 2014.
	WM15	All waste being transported off site must be covered. All transportation must be appropriately licensed to carry that material.
	WM16	Storage of all hazardous substances and dangerous goods will be in accordance with SDS requirements and located in a bunded area. Solid and hazardous wastes will be contained and separated from inert waste.
	WM17	Any hazardous materials will be managed and handled by an appropriately licensed contractor and transported for disposal to a licensed facility.
	WM18	Any material contaminated by spills (e.g., fuel, oil, lubricants) – including empty fuel, oil and chemical containers – will be stored in a sealed secure container within a bunded area and will be transported to a waste disposal site approved by the NSW EPA to accept such material.
	WM19	Incompatible wastes will not be mixed.
	WM20	Bunding and/or appropriate stormwater filters to be placed around/in stormwater pits to prevent entry of pollutants into stormwater drainage system.
	WM21	Stormwater pits to be inspected regularly for litter build-up and signs of leaks or spills. Pits to be cleaned weekly or as required.
	WM22	Biodegradable products will be used wherever practicable.
	WM23	Regular collection of wastes will ensure overfilling of bins and associated air/water pollution is minimised/prevented.
	WM24	Conduct regular litter patrols to ensure litter is effectively controlled on site.
	WM25	Implement the procedures for ash management and biomass outlined in the Redbank Power Station QA/QC, Supply Chain and Material Handling (Verdant Earth, 2021).
	WM26	Any spills of ash around the storage silo that may occur during loading of vehicles for off-site transfer of ash shall be swept and cleaned up immediately to avoid tracking of ash onto road surfaces within the site and potentially impacting on stormwater.

Issue	No	Mitigation Strategy
	WM27	A flexible curtain is to be fitted around the discharge chute if needed to prevent ash being blown out of the vehicle during loading.
	WM28	The blind pit is to be inspected daily and cleaned to remove any ash spilled onto the hardstand beneath the ash storage silo to avoid dust formation.
	WM29	All ash collection trucks shall be fully enclosed (e.g. tankers) or tarped after loading and prior to leaving the site to avoid dust impacts during transport.
Lifecycle	LC	In order to maximise the environmental benefits of the production or electricity with biomass at Redbank Power Station, steps should be made, where reasonable and feasible, to minimise transport distances and implement a switch to biodiesel for chipping and transport.
Air Quality	AQ1	All existing emission controls at Redbank Power Station will be retained for the Proposal.
	AQ2	The monitoring requirements for the Facility are outlined in condition P1 and M2 of existing EPL 11262. These monitoring requirements would continue for the Proposal and will be modified if required following consultation with the NSW EPA.
	AQ3	A Dust Management Plan (see Appendix DD) will be implemented for construction and operation of the Facility.
	AQ4	An Air Quality Management Plan will be prepared and implemented that incorporates the monitoring requirements outlined in EPL 11262 and any other air quality monitoring requirements from associated approvals, permits and licences.
Greenhouse Gas	GHG1	The Greenhouse Gas Mitigation Plan will be reviewed annually. Scope 1 and 3 GHG emissions will be calculated on an annual basis through fuel-based calculations and/or direct emissions monitoring. Mitigation measures, emission reduction strategies and emission offset commitments implemented during the reporting period would be detailed as part of the annual review. The review will address any relevant significant changes to the Proposal and its relationship to the Safeguard Mechanism.
	GHG2	The effectiveness of site management strategies and design will be reviewed on an ongoing basis throughout the life of the Proposal, in line with annual environmental reporting requirements for the Site. The need to review the Climate Change Adaptation Plan risk assessment will be considered for major revisions to NSW climate modelling.
Noise and Vibration	NV1	Installation of a noise barrier as provided in Figure 13.2, constructed of a solid material with minimal gaps having a surface density not less than 8 kg/m2 with a gate leading to the access road (it may be left open between 7am and 10pm).
	NV2	Undertake post commencement validation/verification measurements to confirm compliance. Should the post commencement validation indicate noise levels exceed the assessment criteria imposed in the approval, implement additional acoustic treatment (e.g. plant maintenance, additional treatment to the steam line or other alternatives).
Traffic	TA1	A schedule of all biomass deliveries, and ash removals will be established prior to each day and be site-specific, and that radio contact is maintained with haulage vehicles at all times.
	TA2	A BAL turn treatment for the left turn into Long Point Road from Golden Highway.
	TA3	All staff and haulage trucks will be instructed to use Long Point Road / Golden Highway
	TA4	Update internal pedestrian crossing near the office to be parallel with the centre of the carriageway a new crossing and footpath to ensure safety for all pedestrians per Figure 4 in the TIA.

Issue	No	Mitigation Strategy
	TA5	Drivers will adhere to the Drivers Code of Conduct (DCC) for the Redbank Power Station.
	TA6	The Construction Traffic Management Plan prepared for the Proposal will be reviewed and updated prior to commencement of construction.
	TA7	The Operational Traffic Management Plan prepared for the Proposal will be reviewed and updated prior to commencement of operation.
Soil and Water	SW1	A construction Erosion and Sediment Control Plan will be prepared and implemented prior to the minor areas of soil disturbance.
	SW2	Prior to issue of construction certificate, investigate the in situ compacted liners beneath the water quality pond and stockpile and (during construction) if required, carry out necessary upgrades to the liners to ensure compliance with the Environmental Guidelines – Composting and Related Organics Processing Facilities (DECC – 2004) to ensure the development complies with the applicable environmental guidelines.
	SW3	The raw water storage will be operated with 2 ML headroom to ensure stormwater runoff from the Redbank site occurs less often than once in 10 years.
	SW4	Construct a new grassed swale to reduce the area of catchment 5 (shown in Figure 5 of the Soil and Water Impact Assessment report) that contributes stormwater to the raw water pond.
	SW5	A stainless-steel orifice plate, 300mm high, with a 150mm diameter circular opening in its base, is to be placed over the outlet of the water quality pond. This will detain water in the pond for an extended period which will improve discharge water quality and help reduce the potential frequency of off-site discharge.
	SW6	The water quality pond will be aerated to ensure that it maintains high levels of dissolved oxygen. This is to address a risk that the water quality pond will receive elevated levels of BOD. This may result in the development of anoxic conditions on the water quality pond under low rainfall conditions.
	SW7	Construct a 2m vegetated buffer strip between the stockpile and the concrete channel to help reduce the export of woodchip from the stockpile.
	SW8	Carry out water quality monitoring as detailed in the Water Cycle Impact Assessment (and as detailed above) to manage the risk to water quality and operations from changing fuels.
	SW9	Install a Barramy Trap upstream of the water quality pond. This will enable the dry storage of woodchips which would see reduced leaching.
	SW10	An unexpected contamination finds procedure will be developed and implemented during construction and operation of the Facility. In the event contaminated soil is found in the areas planned for excavation, it will be sampled and classified in accordance with the NSW EPA's Waste Classification Guidelines (2014) and disposed of to a licenced facility approved to accept that waste type.
Hazard and Risk	HA1	A Hazard and Operability (HAZOP) study be conducted of the biomass feed and combustion system at the time of detailed design.
	HA2	The Considerations for Final Design identified in appendix A of the PHA will be reviewed for inclusion in post-consent detailed design phase and assessed in the FSS as applicable, including the following:

Issue	No	Mitigation Strategy
		• Develop safe work method for removing any biomass hung up in the trailer during tipping; • Fire suppression equipment should be upgraded for potential biomass truck fire on sit, as part of the FSS; • Fire protection equipment should be installed or upgraded for a fire in biomass stockpile, as part of the FSS; • Provide fire protection requirements for a truck fire on site; • Provide speed limit signposting on the truck routes on site; • Develop truck driver induction procedure for site access; • Consider installing fire sprays on new conveyors; • Provide fire suppression for fire in biomass receiving hopper; • Provide static earthing for hopper to minimise static electricity generation; • Consider hazardous area classification for biomass receiving hopper/ boiler feed silo in accordance with AS/NZS 60059.10.2- 2012; • Review dust collection/ ventilation requirements for biomass hopper; • Confirm if nitrogen lances will be installed in boiler storage silos; • Consider dust explosion venting for enclosed storages of biomass; • Consider providing CO detectors and alarm in biomass silos and hoppers vapour space; • Conduct a hazard and operability study (HAZOP) of the final design of biomass feed and combustion system; • Consider installing CO detectors at relevant places in the boiler house and alarm for evacuation of the area. Respiratory protection required for return; • Explosion venting in flue gas duct to be considered; • Ensure that fire water system has adequate capacity; and • Maintain spill cleanup kit at the chemicals storage area.
	HA3	Form 1247 of the CASA advisory circular – Plume rise assessments will be submitted to CASA. A copy of the form 1247 will also be submitted to the Operators of: • Singleton Army camp • Hunter Valley Gliding Club (for Warkworth airstrip)
Bushfire	BF1	At the commencement of building works and in perpetuity, a 10m APZ around the entire development footprint shall be managed as an Inner Protection Area (IPA) and supported by a perimeter trail as outlines within PBP 2019.
	BF2	Materials within the south-eastern corner of the facility shall be relocated to allow a minimum 10m separation between the vegetation and material to be established.

Issue	No	Mitigation Strategy
	BF3	Ensure the provided APZ to the north and west are maintained to provide ample separation for BAL-LOW construction and emergency service mobility within the facility within excessive radiant heat exposure.
	BF4	Vegetation management is required in the railway easement to the south with ground and shrub vegetation to <10cm, removing branches below 2m and leaving the canopy screening vegetation.
	BF5	Gates should be installed along boundary fencing association with gaps in the landscaping features to allow emergency services to access neighbouring properties. Access shall be provided in accordance with Appendix 3 of PBP 2019.
	BF6	Upgrade the perimeter access to the south of the stockpile location, signage and turn around facilities to the south-east are required to comply with PBP 2019.
	BF7	A Bush Fire Emergency Management and Operations Plan (Appendix EE) will updated upon final design of the Facility and include: • Igniting management and prevention. • Strategies to reduce ignition. • Strategies to suppress unplanned fires. • Strategies to minimise potential spread of bushfires. • Bushfire Mitigation treatments. • Appropriate woks programming on fire danger days. • Bushfire Emergency Management procedures. The plan will also identify the operations that may be carried out on days of Total Fire Ban and any prohibited activities or exemptions that are notified by the Commissioner of the NSW RFS under the Rural Fires Act s.99. and requirements to notification of the local NSW RFS Fire Control.
	BF8	Fire engineering analysis will establish final design volume, capacity, and distribution of the proposed gun water spray system so that it is sufficient to inhibit the ignition of the woodchip pile during a modelled wildfire event.
Biosecurity	BS1	Avoiding high risk areas such as Phylloxera Infested Zones (PIZ);
	BS2	Restricting access to stockpiles If pests are detected;
	BS3	Reviewing the Department of Agriculture, Fisheries and Forestry's Biosecurity website to ensure that particular pest species could be recognised should they enter Australia.

Issue	No	Mitigation Strategy
	BS4	Consulting the National Pests and Disease Outbreak website regularly for information on pests, diseases and weeds that are under national eradication programs.
	BS5	Size reduction to a nominal <45mm and >8mm for up to 75% of the material. This physical process will help to destroy most insects, larvae and prepupae;
	BS6	Storage in stockpiles for 2-3 weeks within the forest compartment resulting in self-heating and pasteurisation of the core of the pile. Though it is noted that some insects / pathogens could survive in the outer area of the pile.
	BS7	Biomass will be transported in clean trucks, covered and will not be unloaded where there is a risk of pests or pathogens escaping the material.
	BS8	Trucks will be cleaned before returning to the forest compartment.
	BS9	Biomass will be stockpiled on a gravel hardstand surface at the power station, away from soils and vegetation for up to 3 days, and will be continually turned over, reducing the risk of pathogen or insect colonisation of the pile.
	BS10	A pest monitoring and weed control program, including staff training on site, will ensure the adequacy of these biosecurity measures.
Biodiversity	BD1	Construction including stockpiling and materials, plant and equipment storage and materials stockpiling will be confined to the existing disturbed footprint of the Site.
	BD2	An Unexpected Fauna procedure will be developed and followed in the event a native animal is discovered during the course of construction or operation. Work will only re-commence once the requirements of that Procedure have been satisfied.
	BD3	Develop a microbat management plan to be implemented in the event microbat individuals are located during the preclearance survey.
	BD4	Prior to commencement of construction, undertake microbat surveys to determine if any microbat species are present.
	BD5	Prior to commencement of works, during construction and during the operation of the power station, deploy Anabat ultrasonic recording units to determine if there have been impacts on microbat species.
	BD6	If microbats are found during the pre-construction survey, implement daily inspections of structures prior to the commencement of works each day.
	BD7	Staff Site Induction - Prior to commencement of construction, all staff that will be working on in areas of potential habitat should be conducted prior to the commencement of works. This induction would involve how to identify microbats, what to do if microbats are encountered (cease works and consult with the Project Ecologist) and safety procedure for working in proximity to microbats.

	BD8	Plant upgrade works and associated infrastructure should be completed between March and September, outside of microbat breeding periods wherever possible.
	BD9	All plant and machinery is to be maintained and operated appropriately during operations of the power plant, to avoid excessive noise of machinery due to poor maintenance or faulty parts.
Heritage	H1	An Unexpected Aboriginal Cultural Heritage Items procedure will be developed and followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. Work will only re-commence once the requirements of that Procedure have been satisfied.
	H2	The persons responsible for the management of onsite works will ensure that all staff, contractors and others involved in construction and maintenance related activities are made aware of the statutory legislation protecting sites and places of significance. Of particular importance is the National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010, under the National Parks and Wildlife Act 1974;
	H3	An Unexpected Heritage Items will be prepared and followed in the event that any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered during construction or operation of the Proposal. Work will only re-commence once the requirements of that Procedure have been satisfied.