

APPENDIX 3 – PROJECT ENVIRONMENTAL RISK ASSESSMENT

Issue	Aspect	Impact	Risk Assessment Ranking			Environmental Impact Statement Scope
			C	L	R	
Noise and vibration	Vehicle movements and construction activities	Excessive noise and vibration generation at sensitive receivers	Mod	2	6, Mod	A Noise and Vibration Impact Assessment has been undertaken for the project in accordance with relevant NSW regulatory policy and guidelines, including the <i>Industrial Noise Policy 2000</i>, <i>Interim Construction Noise Guidelines</i> and <i>Road Noise Policy</i>. The assessment determined likely criteria for the project and included an assessment of construction and operational noise and vibration impacts, and cumulative noise impacts with other approved industry in the vicinity. Mitigation and management measures have been developed to reduce the noise and vibration impacts of the project. A noise management plan will be required for the construction phase of the project.
	Vehicle movements from maintenance activities		Neg	2	2, Low	
Visual amenity	Visibility of the proposed new infrastructure	Impact to visual amenity of existing environment	Mod	4	12, High	A Visual Impact Assessment has been undertaken for the project in accordance with current best practice. The assessment consisted of a desktop review – aerial photography, proposed works, existing reports and planning policy. In addition, a field inspection was undertaken to determine the visibility of the proposed project from a local and regional context.
Traffic and Transport	Construction traffic, equipment deliveries, heavy vehicle movements		Mod	3	9, Mod	A Traffic and Transport Impact Assessment has been undertaken for the project in accordance with the 'Guide to Traffic Generating Developments' (RTA), <i>Road Design Guide</i> (RMS), and <i>Ausroads Guide to Traffic Management Part 12: Traffic Impacts of Development</i> .

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	Vehicle movements from employees, and in-bound and out-bound deliveries during operations	Increased traffic movements	Minor	1	2, Low	The assessment included an assessment of construction and operational traffic types, volumes and movements on site and existing road networks, and predicted impacts of increased traffic on road safety. Mitigation and management measures have been proposed to reduce the traffic related impacts.
Aboriginal heritage	Ground disturbance during construction	Disturbance of Aboriginal artefacts, sites or places of cultural heritage significance	Mod	2	6, Mod	An Aboriginal and Historic Heritage Assessment for the project has been undertaken in accordance with the DECCWs <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i>. The Assessment consisted of a desktop review - database and literature search of previously recorded Cultural Heritage information. A review was also undertaken of a report for the site prepared by Australian Cultural Heritage Management consultants (ACHM, 2017) who also undertook a field survey. Consultation is currently continuing with the local Aboriginal community. Mitigation and management strategies have been provided in the event that an Aboriginal artefact is discovered. To date there are no recorded sites within the project area, nor were any items discovered during field activities undertaken by ACHM.
Historic heritage	Disturbance during construction	Disturbance of items with historic heritage significance	Minor	1	2, Low	A desktop review - database and literature search of previously recorded historic heritage information. A review was also undertaken of a report for the site prepared by Australian Cultural Heritage Management consultants (ACHM, 2017) who also undertook a field survey. To date there are no listed items within the project area, nor were any items discovered during field activities undertaken by ACHM.

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Biodiversity	Disturbance of biodiversity during construction and operations	Disturbance to State and Federally listed species, communities or habitat for species	Mod	4	12, High	A Biodiversity Assessment report has been prepared for the Project in accordance with the relevant Government guidelines and policies. Fauna surveys and habitat assessment identified a number of threatened and/or migratory species (not predicted through the BioBanking calculator) with a moderate chance of occurring within the development site on at least an occasional basis. The development site is not considered to provide habitat that is important to any of these species.
Surface Water and Groundwater	Disturbance of soils during construction	Sediment movement resulting in contamination of nearby surface water and groundwater	Mod	3	9, Mod	A Surface and Groundwater Assessment has been undertaken for the Project. The Assessment included a review of existing surface and ground water data, the identification of surface and groundwater resources, assessment of existing surface and groundwater hydrology, and an assessment of potential surface water and groundwater impacts from the development. Measures have been developed to mitigate and or manage surface and groundwater and soil contamination issues associated with the project.
	Flooding / stormwater	Contamination of nearby surface water and groundwater resulting from surface water runoff from site	Neg	2	2, Low	
		Flooding on the site and to infrastructure	Neg	2	2, Low	

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Soils, Land Use and Agriculture	Construction and operations	Loss of agricultural productivity, soil degradation, and change of land use	Minor	2	4, Mod	A desktop assessment of land use, soil, and agricultural impacts has been prepared from publically available information from Federal and State government agencies. With the implementation of mitigation strategies for erosion, biosecurity, and land use, it has been determined that the solar farm can exist with some ongoing agricultural grazing activities and with minimal impact to soil resources.
Air Quality	Construction	Elevated airborne, deposited dust from construction activities and vehicle movements	Mod	2	6, Mod	Due to the short duration of the construction phase of the development, limited pollution generating activities and the rural nature of the area, a quantitative assessment of air quality impacts has been prepared. This assessment considered the current surrounding pollution generating activities, dust generation from the proposed development during construction and operations, and the development of an EMP to manage dust impacts. Mitigation and management measures have been developed to reduce the impacts on air quality.
	Operations	Vehicle movements from maintenance works	Minor	2	4, Mod	
Electromagnetic Interference	Construction and operations	Working adjacent to high voltage power lines, transformers, inverters and substation	Neg	1	1, Low	An assessment of Electromagnetic Fields (EMFs) has been prepared in accordance with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields (1998). Protective measures to reduce personal harm from EMFs include engineering design, administrative control, and personal protective clothing. The works undertaken for the proposed development are not expected to exceed the basic restriction levels.

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Bushfire	Construction and operations	Potential for bushfire to impact on the development	High	2	8, Mod	A Bushfire Threat Assessment has been prepared in accordance with Planning for Bushfire Protection guidelines 2006. The site is not mapped as Bushfire Prone Lands under the Berrigan LEP 2013. However a BTA has been prepared to ensure suitable for protection and prevention is in place in the event of a fire in or adjacent to the development.
Socio-economic	Social	Demands on local infrastructure and services	Mod	2	6, Mod	A desktop socio-economic assessment of the Project has been undertaken as part of the overall EIS. The economic benefits of the Project have been considered, in addition to the potential social impacts.
	Economic	Increased employment opportunities for local residents Increasing demands for services within the local area	Minor	2	4, Mod	
Waste	Generation of general waste	Large volumes of packaging waste from PV equipment	Minor	2	4, Mod	A desktop waste assessment has been undertaken as part of the EIS. Mitigation and management measures have been proposed to reduce the impacts associated with waste management on site and ensure compliance with regulatory and statutory requirements and ensure consistency with the aims, objectives and guidance in the <i>NSW Waste Avoidance and Resource Recovery Strategy 2014-2021</i> .
Cumulative impacts	Construction and operations	Cumulative impacts on existing receivers	Neg	2	2, Low	A search of the Major Projects Register on the Department of Planning and Environment (DPE) website was undertaken on the 29 August 2017 to identify any other major projects within the vicinity of the development site which would likely to contribute to cumulative impacts. A search was completed for the Berrigan LGA. This search did not identify any other active major projects in the council area that would add to cumulative impacts.

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						Adverse cumulative impacts are anticipated to be manageable due to the ability to effectively screen infrastructure in this low relief landscape and through the implementation of dust management strategies.

Risk Assessment Matrix

Likelihood	Consequence					
	Negligible	Minor	Moderate	High	Critical	Catastrophic
6 – Certain	6	12	18	24	30	36
5 – Very Likely	5	10	15	20	25	30
4 – Likely	4	8	12	16	20	24
3 – Unlikely	3	6	9	12	15	18
2 – Possible	2	4	6	8	10	12
1 - Almost Impossible	1	2	3	4	5	6

Risk Scores: 1 - 3 = Low; 4 - 10 = Moderate; 12 - 16 = High; 18 - 24 = Very High; 25 - 36 = Extreme

Likelihood Classification Used for the Risk Framework

Likelihood	Description	Frequency
Certain	Common Occurrence	At least daily
Very Likely	Expected to occur in most circumstances	Once per week
Likely	Probably will occur or has happened in the past	Once per month
Unlikely	Occurs Infrequently	Less than once per year
Possible	Could happen at some time	Less than once per 10 years
Almost Impossible	Not Likely to Occur	Less than 1 per 100 years

Consequence Table

Severity Level	Consequence	Health and Safety	Natural Environment	Community Relations and Cultural Heritage	Reputation/Media	Legal	Damage/Loss/ Business Interruption
6	Catastrophic	Multiple Fatality	Significant and irreversible impact on threatened species, habitat(s) or ecosystem(s)	Irreparable damage to sites of high cultural significance.	Undeniably justified Government condemnation for illegal/unacceptable behaviour.	Major prosecutions and fines resulting in incarcerations for senior executives.	Significant Financial Loss > \$10 Million
5	Critical	Fatality	Very serious long term environmental impairment of ecosystem function.	Very serious widespread social impact. Irreparable damage to valued cultural items.	Prolonged condemnation by media and/or NGO (national outcry).	Significant prosecutions and fines. Very serious litigation, including class actions.	Major \$1M - \$10M
4	High	Lost Time Injury	Serious medium term environmental effects.	Ongoing serious social issues. Significant but repairable damages to structures/items of cultural significance.	Serious public and/or media outcry.	Major breach of regulation. Major litigation.	High \$100,000 - \$1M
3	Moderate	Medical Treatment required. Medical Treatment Injury.	Moderate short term effects but not effecting overall ecosystem function.	Ongoing social issues. Minor permanent damage to items of cultural significance.	Attention from media and/or heightened concern by local community.	Moderate legal issues, non-compliances and breaches of regulation.	Low Financial Loss <\$100,000
2	Minor	First Aid Treatment	Minor effects on biological or physical environment.	Minor medium term social impacts.	Minor adverse local public or media attention and complaints.	Minor legal issues, non-compliances and breaches of regulation	Low Financial Loss <\$10,000
1	Negligible	No medical attention. Report only.	Limited damage to minimal areas of low significance.	Low level repairable damage to commonplace structures.	Public concern restricted to local complaints.	Low level legal issues.	Minimum Financial Loss <\$1000