APPENDIX

E

Revised Environmental Risk Assessment

MAULES CREEK COAL PROJECT

REVISED ENVIRONMENTAL RISK ASSESSMENT

for

Aston Coal 2 Pty Limited

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
Ecology	Vegetation clearing, drilling, blasting and topsoil stripping	Loss of biodiversity and disruption to threatened flora and fauna or likely habitats	III	A	High	An Ecological Impact Assessment has been completed for the Project by Cumberland Ecology in accordance the *Draft Guidelines for Threatened Species Assessment under Part 3A of the Environmental Planning and Assessment Act 1979* (DEC, 2005b). This assessment has identified the potential impacts of the Project on flora and fauna (including listed threatened species and vegetation communities). Management and mitigation measures have been recommended and will include: • Development of a Biodiversity Offset Strategy that adequately compensates impacts caused by the Project, comprising of significant areas of Box Gum Woodland and other native vegetation; • Mine plan and its operations have been designed to limit the area of disturbance of native vegetation; • Prepare a Biodiversity Management Plan,	III	D	Medium
		Disturbance to Federally listed species	III	A	High				

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			C	L	R		C	L	R
						including a flora and fauna monitoring program; • Implement a clearing protocol to minimise impacts on sensitive flora and fauna; • Prepare a detailed Rehabilitation & Landscape Management Plan; • Mine plan designed to enable progressive rehabilitation; • Protection and enhancement of existing vegetation; • Regeneration of conservation areas to improve overall environmental outcomes; and • Augmentation of existing habitat and direct impact minimisation strategies.			
Archaeology and Cultural Heritage	Vegetation clearing, drilling, blasting and topsoil stripping	Disturbance of Aboriginal artefacts, sites or places of cultural heritage significance	III	B	High	An Aboriginal Archaeological and Cultural Heritage Impact Assessment has been conducted for the Project by AECOM Australia Pty Ltd in accordance with the *National Parks & Wildlife Act 1974: Part 6 Approvals, and DECCWs Interim Community Consultation Requirements for Applicants* and *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. An Aboriginal Heritage Management Plan to detail how all sites within the Project Boundary will be managed. This Management Plan will be developed	III	D	Medium

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						in consultation with the Aboriginal stakeholders and DECCW.			
		Disturbance of Non-Indigenous heritage sites	III	C	High	Archaeology Australia has completed a Non-Indigenous Heritage Assessment in accordance with NSW Heritage Office's NSW Heritage Manual. No significant Non-Indigenous Heritage sites were identified within the Project Boundary or are likely to be impacted by the Project.	III	D	Medium
Water Management	Topsoil stripping, haul roads, un-vegetated spoil	Dirty water runoff entering local waterways	II	A	High	Aston will develop and implement a Surface Water Management Program for the Project which will source, capture, divert, store, monitor, utilise and reticulate water onsite. Surface water management commitments will also include controls which ensure clean runoff is separated from runoff within disturbed areas; drainage lines are constructed to be stable and natural in appearance and the maintenance improvement of water quality in the local area.	II	C	Medium
	Coal extraction and overburden removal	Groundwater inflow into pit	II	C	Medium	A Groundwater Impact Assessment was conducted for the Project by Australasian Groundwater and Environmental Consultants (AGE). A finite 3D, numerical simulation package (SURFACT MODFLOW) was be utilised to simulate the likely	II	C	Medium
		Drawdown of aquifers on surrounding water	II	C	Medium		II	D	Low

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		users				impacts of the Project on groundwater (including groundwater inflows, drawdown of the Permian and alluvial aquifers and any possible impacts on surrounding private boreholes). The modelling considered potential cumulative impacts on the groundwater regime with neighbouring mining operations. An Environmental Monitoring Program, which will include groundwater monitoring, will be developed and implemented throughout the life of the Project to validate predictions from this model. Appropriate licences for the interception of groundwater will also be sought from NOW.			
		Cumulative impacts with surrounding users	II	D	Low		II	D	Low
	Coal processing and production	Water demand for dust suppression and coal washing	II	B	Medium	A surface water impact assessment was conducted for the Project by WRM Water & Environment. The assessment has included the preparation of a water balance and identification of water demands and supplies and the management requirements for the Project. Aston has in place a 3,000 unit High Security water allocation from the Namoi River, which will supplement water supplies collected within the mine water management system.	II	D	Low
	Water discharges	Surface water	III	B	High	A Water Management Plan will be developed and implemented which will describe the management	III	D	Medium

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	into local waterways	contamination				system to source, capture, divert, store, monitor, utilise and water for the Project. A primary aim of the management system will be to divert water from the upstream natural catchment around the operations where possible.			
		Contaminated water from wash down bays, etc	III	C	High	The Water Management Plan will consider the appropriate storage and management of contaminated water on site.	III	D	Medium
	Flooding	Increased flood levels and erosion risk on the Namoi River and Back Creek channels	III	D	Medium	A relevant flood water impact assessment of the Namoi River and Back Creek was conducted by WRM for the Project. The assessment found that the proposed rail line will not have any significant impact upon the flooding regime of the Namoi River. Additionally, the assessment confirmed that the Project Boundary is outside the 100 year ARI flood extent associated with Back Creek.	III	E	Medium
Air Quality	Vegetation clearing, drilling and topsoil stripping	Wind blown dust and machinery exhaust fumes contributing to elevated dust levels	III	C	High	An Air Quality and Greenhouse Gas Impact Assessment was conducted for the Project by PAE Holmes in accordance with the '*Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales*' (DEC, 2001).	III	D	Medium
	Overburden emplacement		III	B	High	Aston will develop and implement a comprehensive Environmental Monitoring Program which will	III	D	Medium

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	Uncovering of coal		III	D	Medium	comprise Air Quality Monitoring for the Project. This Monitoring Program will provide a framework to manage monitoring, assessment and mitigation of air quality impacts on the local community. Management techniques for managing air quality impacts of the Project will include utilisation of a real time air quality monitoring system to proactively manage operations. Minimising disturbance areas, water cart deployment, enforced speed limits, drills fitted with dust suppressant, extensive dust suppression on haul roads and heavily trafficked areas, progressive rehabilitation and maintenance, alarm systems, efficient dumping and tipping operations will also be employed.	III	D	Medium
	Coal, rejects and overburden haulage		III	B	High		III	C	High
	Coal processing and transport		III	D	Medium		III	D	Medium
	CHPP operation and stockpiles		III	D	Medium		III	D	Medium
Greenhouse	Combustion of diesel fuel	Greenhouse gas emissions	II	C	Medium	The air quality impact assessment included the assessment greenhouse gas Scope 1, 2 and 3 emissions in accordance with the Australian Greenhouse Office's (AGO) '*Factors and Methods Workbook*' (AGO, 2005). Greenhouse Gas emissions from the Project will be managed and minimised, where possible. Aston will achieve this through the use of energy management systems, targeting continuous improvement in	II	C	Medium
	Electricity use		II	C	Medium		II	C	Medium
	Downstream Impacts from the Burning of Coal		II	C	Medium		II	C	Medium

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						energy efficiency, investigating the use of biodiesel and electric solar hot water and small scale vegetation plantings for the purposes of carbon sequestration.			
	Blasting	Greenhouse gas emissions, fume and dust Generation	III	D	Medium	Blasting effects will be mitigated by restricting blasting to suitable weather conditions and ensuring optimal material breakage and movement as well as minimising the amount of explosives used.	III	D	Medium
Acoustics	Coal, rejects and overburden haulage	Excessive Noise generation	II	B	Medium	An Acoustic Impact Assessment was conducted for the Project by Bridges Acoustics in accordance with the *Industrial Noise Policy 2000* (INP). The assessment identified the potential noise impacts of the Project including associated infrastructure, traffic and rail noise. Cumulative noise impacts with surrounding mining operations and industry were also considered by the assessment. Aston Resources will develop and implement a Environmental Monitoring Program which will consider Noise monitoring for the Project. This Monitoring Program will provide a framework to manage monitoring, assessment and mitigation of	2	D	low
	Plant and equipment working in-pit and on overburden dumps		II	B	Medium				
	Train movements on rail loop and spur		II	C	Medium				

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	CHPP operation and stockpiles		II	B	Medium	noise impacts on any surrounding private receivers. Management controls will include the assessment of mine planning, operational and engineering methods, real-time monitoring, and alarming systems. Further the installation of noise mitigation structures around the key infrastructure areas, restricted operation of trucks to day time hours, the potential acquisition of surrounding land and measures for the minimisation of Project traffic noise.			
	Coal loading at rail loop		II	C	Medium				
	Product Coal Transport		II	C	Medium				
	Increased traffic movements	Excessive Noise Generation	II	C	Medium	The Acoustic Impact Assessment has confirmed that there should be no significant impact of noise on sensitive receivers as a result of the Project. Aston plans to the transport of employees to the site via bus, hence reducing traffic movements on the key roads.	II	D	Low
	Blasting	Overpressure and ground vibration impacts at near neighbours and heritage properties	II	B	Medium	A blasting impact assessment was conducted for the Project by Bridges Acoustics as a component of the Acoustic Impact Assessment. All privately owned receivers were predicted to experience ground vibration and overpressure levels below relevant amenity criteria. Mitigation measures will be developed for blasting adjacent to sensitive receivers and heritage properties, as required. These may include	II	D	Low

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						monitoring of nearby residences to ensure ongoing compliance with all vibration and overpressure criteria, minimisation of blast impacts, blasting during day time hours only, mitigation of fly-rock impacts, consultation with surrounding residents, appropriate personnel training, documentation of blasts, review of blast procedures and reporting of blast monitoring results.			
Visual	Overburden stockpile dumps	Visual impact to surrounding receivers	I	C	Low	A Visual Impact Assessment was completed for the Project by JVP Visual Planning and Design to assess the potential visual impacts of the Project and identify mitigation and management measures, as appropriate. Management commitments will include the establishment of vegetation screens in key areas, rehabilitation, evaluation of earthworks and final landform design, consideration to night lighting, the construction and placement of Project infrastructure and implementation effective operational measures.	I	D	Low
	Exposed earthworks		I	C	Low				
	Lighting from mobile and fixed equipment		I	B	Medium				
Mine Rehabilitation	Topsoil Stripping and land preparation	Loss of productive topsoil	II	C	Medium	A Soils and Land Capability Impact Assessment was completed for the Project by GSS Environmental. The assessment included the mapping of the soil types within the Project Boundary, identification of any soil materials with potentially adverse quality	II	D	Low
		Deterioration of land capability	II	C	Medium		II	D	Low

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						(e.g., acid sulphate generating) and identification of the suitability of topsoils for use as topdressing material. Topsoil materials will be initially stripped and placed on shaped spoil where possible or stockpiles for later use on rehabilitation areas.			
	Rehabilitation	Erosion and sedimentation	II	B	Medium	Rehabilitation planning for the Project will be undertaken progressively to ensure the total area of disturbance at any one time is minimised to reduce the potential for wind-blown dust, visual impacts and increased sediment-laden runoff. Rehabilitation will be designed to be compatible with the surrounding landform, stable and able to support final land use(s). To ensure a stable final landform, the majority of the final overburden emplacement slopes will be shaped to 10 degrees or less. Aston will aim to restore land disturbed by mining to a condition equivalent to or better than that which existed prior to mining which will include the backfilling of the pit to a RL suitable for a sustainable landform. It is anticipated that with good land management practices, final rehabilitation of the Project will restore the native vegetation communities to a	II	C	Medium
		Invasion of weed species	I	B	Medium		I	C	Low
		Invasion of feral animals	I	C	Low		I	C	Low
	Final Landform	Acid Rock Drainage	IV	C	High		IV	D	Medium
		Unstable landform	III	C	Medium		III	E	Medium
		Poor drainage	III	D	Medium		III	D	Medium
		Erosion	II	C	Medium		II	C	Medium

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						similar area to its original coverage. The close proximity of the rehabilitated lands to adjacent stands of remnant native vegetation will provide for colonisation of native species into the future. Rehabilitated land from the Project will be predominantly topsoiled and comprised of a mixture of native trees and shrubs representing habitat of the existing forestry values. Reafforestation will be undertaken consistent with the surrounding landscape aiming to link remnant native vegetation communities with re-established habitat areas. The rehabilitation strategy for the Project will focus on biodiversity and the establishment of habitat for Threatened species.			
Traffic and Transport	Increased vehicle movements from employees, deliveries and train loading	Increased traffic movements	IV	D	Medium	A Traffic and Transport Impact Assessment was completed for the Project by Hyder Consulting in accordance with the *'Guide to Traffic Generating Developments'* (RTA, 2002). The assessment has reviewed the capacity of the affected road network to cater for differing traffic volumes due to the proposed change in traffic flows. Road network enhancements that were identified for the Project will continue to be	IV	E	Low

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	Road Upgrades	Public Perception	I	C	Low	discussed with the NSC and GSC as relevant. Potential noise impacts from traffic have been assessed in the acoustic assessment. Approval for any road maintenance or enhancement works will be sought under the *Roads Act 1993*.	I	D	Low
Waste Management	General waste	Land contamination	I	C	Low	A Waste Management System will be developed and implemented for the Project which shall provide management procedures to ensure the environmentally responsible disposal, tracking and reporting of all waste generated on site.	I	D	Low
	Rejects	Water contamination	III	C	High		II	C	Medium
	Sewage	Water contamination	II	D	Low		II	E	Low
Hazardous materials	Storage and Handling	Soil and water contamination	II	C	Low	All hazardous materials will be managed in accordance with the relevant hazardous materials management procedures.	II	D	Low

MAULES CREEK COAL PROJECT

Risk Assessment Tools

Matrix for Determining Level of Risk

Likelihood Label	Consequence Label				
	I	II	III	IV	V
A	Medium	High	High	Very high	Very high
B	Medium	Medium	High	High	Very high
C	Low	Medium	High	High	High
D	Low	Low	Medium	Medium	High
E	Low	Low	Medium	Medium	High

Likelihood Scale

Level	Descriptor	Description	Indicative Frequency (expected to occur)
A	**Almost certain**	The event will occur on an annual basis	Once a year or more frequently
B	**Likely**	The event has occurred several times or more in your career	Once every three years
C	**Possible**	The event might occur once in your career	Once every ten years
D	**Unlikely**	The event does occur somewhere from time to time	Once every thirty years
E	**Rare**	Heard of something like the occurring elsewhere	Once every 100 years

Consequences Scale

Severity Level	Consequences Types				
	Health & Safety	**Natural Environment**	**Social/ Cultural Heritage**	**Community/Govt/ Reputation/Media**	**Legal & Regulatory**
V	Multiple fatalities, or significant irreversible effects to >50 persons	Very serious, long-term environmental impact that is widespread and unconfined, leaves major damage			Significant prosecution and fines. Very serious litigation including class actions. Suspended or reduced operation
IV	Single fatality and/or severe irreversible disability (>30%) to one or more persons		On-going serious social issues. Significant damage to structures/items of cultural significance	Serious public or media outcry (international coverage)	Major breach of regulation. Major litigation. High potential for prosecution
III	Moderate irreversible disability or impairment (>30%) to one or more persons	Serious but confined medium term environmental effects near the source		Significant adverse national media/public/NGO attention	Serious breach of regulation with investigation or report to authority with prosecution and/or moderate fine possible
II	Objective but reversible disability requiring hospitalisation	Moderate, short-term effects on environment (near the source, reversible and confined)	On-going social issues. Permanent damage to items of cultural significance	Attention from media and/or heightened concern by local community. Criticism by NGOs	Minor legal issues, non-compliances and breaches or regulation. Low potential for impact
I	No medical treatment required or requiring first aid treatment at the most	Minor environmental effects (near the source, confined and quick to reverse)	Minor medium-term social impacts on local population. Mostly repairable	Minor, adverse local public or media attention or complaints	