



APPENDIX 5

**Risk Assessment Document
Newstan Colliery
Newstan Main West s75W Modification**

Background:

Centennial Newstan Pty Limited (Centennial Newstan) owns and operates the Newstan Colliery (Newstan). Newstan is located approximately 25 km south-west of Newcastle and 140 km north of Sydney within the Lake Macquarie Local Government Area. The Newstan pit top and surface facilities is located 4 km north of the township of Toronto.

Newstan is an underground longwall coal mine producing thermal and semi soft coking coal for both the domestic and export markets. Extensive underground mining has taken place over the years in the Young Wallsend, Great Northern, Fassifern, Borehole and West Borehole seams.

Run of Mine (ROM) coal produced by Newstan is transported underground from the working face to the surface and delivered to the Newstan CPP via a high capacity conveyor system. The final product coal suitable for the domestic power generation market is stockpiled adjacent to the CPP while awaiting transportation. Transportation of domestic product coal occurs primarily via trucking operations along the Eraring Private Haul Road which operates between Newstan and Eraring Power Station. Domestic product coal is also occasionally transported via road and rail to Vales Point in order to meet intermittent short-term requirements. Coal for both the domestic and export market is stockpiled within the Newstan Rail Loop before it is loaded onto trains by Front End Loaders. The coal is then transported via rail to the domestic markets or the Port of Newcastle via the Newstan Rail Loop and the Main Northern Railway Line. Coarse and fine reject material, produced from the washing of coal through the Newstan CPP is currently transported and piped to the approved Newstan Southern Reject Emplacement Area (SREA).

Newstan ceased underground mining production in 2009 however continues to operate the Newstan surface facilities area to process and handle coal from other Centennial Coal operations.

Newstan Colliery is seeking a modification to DA 73-11-98 subject to Section 75W of the EP&A to allow for the recommencement of first workings bord and pillar mining in an area referred to as Main West located beyond the existing Development Consent boundary.

Objective:

The following Hierarchy of Controls offers a framework for considering the effectiveness of controls. Note that the effectiveness of a control that is intended to reduce a risk decreases from top to bottom of the list. In other words, the closer the control type is to the top of the hierarchy, the more potentially effective the control.

- Eliminate the hazard or energy source (do not use the energy)
- Minimise or replace the hazard or energy source (reduce the amount of energy to a less damaging level or replace the energy with another that has less potential negative consequences)
- Control the hazard or energy using engineered devices (ex. Lock outs, chemical containers, mechanical roof support, gas monitors, etc.)
- Control the hazard or energy by using physical barriers (ex. machine guarding, warning signs, etc.)
- Control the hazard or energy with procedures (ex. Isolation procedures, standard operating procedures, etc.)
- Control the hazard or energy with personal protective equipment (ex. hard hats, boots with toe caps, gloves, safety glasses, welding gear, etc.)
- Control the hazard or energy with warnings and awareness (ex. posters, labels, stickers, verbal warnings, etc.)

The objectives of this Risk Assessment is to identify the environment and community risks associated with the proposed Main West mining project at Newstan and to identify knowledge gaps where further information and/or assessment will be required to support an Environmental Assessment for the proposed Project.

Potential Hazards:

The potential hazards to this project include:

1. Impacts to threatened flora and fauna as a result of subsidence;
2. Impacts to Aboriginal Archaeological sites from subsidence;
3. Impact to groundwater aquifers and other groundwater users;
4. Impacts to the existing Newstan water management system;
5. Increase in GHG emissions and costs of abatement to the business; and
6. Impacts to the surrounding communities.

Risk Assessment Boundary Definition:

This Risk Assessment is a preliminary Risk Assessment aimed to identify knowledge gaps and areas where further assessments will be required. The full extent of environmental risks associated with this project will not be understood until further and more detailed investigations have been undertaken. This risk assessment should be reviewed following the completion of the detailed investigations to ensure all environmental risks associated with the Project have been identified, understood and are at an acceptable level for the company.

Risk Assessment Methods:

Yes/No	Method
	PROACTIVE TOOLS
Yes	Workplace Risk Assessment and Control (WRAC)
No	Fault Tree Analysis (FTA)
No	SIL Analysis to Australian Standard 61508 - Under Development
No	Bow Tie Analysis (BTA)
No	Failure Modes and Effects Analysis (FMEA)
	REACTIVE TOOLS:
No	Root Cause Analysis (RCA) - Under Development



Venue and Time:

Date	Description	Location	Start Time	End Time	Comment
1. 14 June 2010	Scoping	Newstan Colliery	9:00 am	10:00 am	
2. 15 June 2010	Assessment	GSS Environmental Office	10:00 am	12:00 pm	
3. 27 August 2010	Review	Newstan Colliery	2:00 pm	3:30 pm	Reviewed due to changes in Project Description
4. 2 February 2011	Review	Newstan Colliery	1:00 pm	2:30 pm	Reviewed due to changes in Project Description



Team Selection

Name	Title	Company	Email
James Wearne	Environmental & Community Coordinator - Projects	Centennial	James.Wearne@centennialcoal.com.au
Chad Stockham	Environmental Engineer	GSS Environmental	stockham@gssenvironmental.com
Colin Driscoll	Environmental Biologist	Hunter Eco	cd_enviro@bigpond.com
Darrell Rigby	Principal / Archaeology Manager	RPS	Darrell.Rigby@rpsgroup.com.au
Stuart Gray	Senior Hydrogeologist	GHD	SCGray@ghd.com

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
1. Ecology	There is a risk to Newstan from ::: Impacts to Threatened flora, Endangered Ecological Communities (EEC's) and/or Groundwater Dependant Ecosystems (GDEs) ::: Caused by: Subsidence Resulting in: Loss of or damage to threatened flora species.	1.1.a. Mining is to be designed to result in less than 20 mm of surface subsidence.	D (D)	4 (E)	21 (L)	1. Undertake an ecological impact assessment for the proposed Project.
	There is a risk to Newstan from ::: Impacts on Matters of National Environmental Significance under the Commonwealth EPBC Act ::: Caused by: Subsidence Resulting in: Loss of or damage to listed Matters of National Environmental Significance.	1.2.a. Mining is to be designed to result in less than 20 mm of surface subsidence.	D (D)	4 (E)	21 (L)	2. EPBC referral to be developed for submission to SEWPaC. 1. Undertake an ecological impact assessment for the proposed Project.
2. Archaeology	There is a risk to Newstan from ::: Impacts to Aboriginal Archaeological sites ::: Caused by: Subsidence Resulting in: Damage off/to Aboriginal sites.	2.1.a. AHIMS search conducted for previous investigations and no AHIMS registered sites identified within the Project Area. 2.1.b. Archaeological investigation carried out in 2007 for longwall 24 modification. No archaeological sites were identified within the Project Area. 2.1.c. Mining is to be designed to result in less than 20 mm of surface subsidence.	D (D)	4 (E)	21 (L)	3. Undertake Archaeological Impact Assessment for Project 4. Undertake Aboriginal consultation in accordance with the DECCW 2010 guidelines.

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
3. Groundwater	There is a risk to Newstan from ::: Impacts to alluvial aquifers ::: Caused by: Subsidence Resulting in: Impacts to GDEs or Loss of alluvial groundwater.	3.1.a. Preliminary Groundwater Assessment for Newstan Lochiel Project Area.			5	Impact assessment report of proposed Project on groundwater to be included in Environmental Assessment.
		3.1.b. Groundwater modeling for Newstan Colliery.			6	Ecology assessment to identify any groundwater dependant ecosystems within the Project Area.
		3.1.c. Existing Newstan monitoring bore network.	D (D)	4 (E)	21 (L)	7 Recalibrate the Newstan hydrogeological model
		3.1.d. Mining is to be designed to result in less than 20 mm of surface subsidence.				
4. Water Management	There is a risk to Newstan from ::: Impacts to groundwater users::: Caused by: Loss of groundwater Resulting in: Impacts to groundwater users.	3.2.a. Preliminary Groundwater Assessment for Newstan Lochiel Project Area			8.	Impact assessment report of proposed Project on groundwater users to be included in Environmental Assessment.
		3.2.b Mining is to be designed to result in less than 20 mm of surface subsidence..	D (D)	4 (E)	21 (L)	9 Recalibrate the Newstan hydrogeological model
		3.2.c. Groundwater modeling for Newstan Colliery.				
		4.1.a. Newstan Colliery Revised Water Management Plan v9				10. Review the Newstan hydrogeological model to see if it can handle the change in volume of groundwater.
5. Surface Water	There is a risk to Newstan from ::: Impacts to creeks ::: Caused by: subsidence Resulting in: Changes to surface water flows or Impacts to creek morphology .	4.1.b. Groundwater modelling for Newstan Colliery				11. Assess impacts of water being pumped into Fassifern seam will have on the buffer (during 24hr 100 yr ARI)
		4.1.c. Current 8 m buffer storage in the Fassifern seam (10 m below Stony creek pipeline)	C (D)	4 (E)	18 (M)	12. Assess what changes to water management system is required.
		5.1.a. Creeks within Project area have been mapped				13. Impact assessment report of proposed Project on surface waters
		5.1.b. Mining is to be designed to result in less than 20 mm of surface subsidence.	C (D)	5 (E)	22 (L)	

WRAC Analysis Worksheet

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Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
6. Subsidence	There is a risk to Newstan from ::: Subsidence greater than predicted :::	6.1.a. Newstan geology well understood. 6.1.b. Previous mining experience.				14. Engage consultant to provide report that can demonstrate mining can be designed to result in less than 20 mm of surface subsidence.
	Caused by: geology or Incorrect mine design or Incorrect subsidence assumptions		C (D)	5 (E)	22 (L)	
	Resulting in: Impacts to surface features.					
7. Surface infrastructure	There is a risk to Newstan from ::: Impacts to non Centennial owned surface infrastructure :::	7.1.a. Location of non Centennial owned infrastructure known and mapped. 7.1.b. Stakeholder Engagement Plan has been developed.				15. Assess impacts of proposed Project on surface infrastructure within the Environmental Assessment.
	Caused by: subsidence		D (D)	5 (E)	24 (L)	
	Resulting in: Damage to infrastructure.					
8. Air	There is a risk to Newstan from ::: Impacts to air quality :::	8.1.a. No changes proposed to the approved Newstan coal handling operations.				16. Review the Newstan air model to confirm compliance with air quality criteria.
	Caused by: Coal handling operations or operation of surface infrastructure	8.1.b. No additional surface infrastructure required.	D (D)	4 (E)	21 (L)	
	Resulting in: Exceedances of air quality criteria.					
9. Noise	There is a risk to Newstan from ::: Noise Impacts :::	9.1.a. No changes proposed to the approved Newstan coal handling operations.				17. Review the Newstan noise model to confirm compliance with air quality criteria.
	Caused by: Coal handling operations or operation of surface infrastructure	9.1.b. No additional surface infrastructure required.	D (D)	4 (E)	21 (L)	
	Resulting in: Exceedances of noise quality criteria.					

WRAC Analysis Worksheet

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Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
10. Social	There is a risk to Newstan from ... Impacts to the community or community action... Caused by: Subsidence or mining related activities or lack of information or incorrect information. Resulting in: Negative impacts to surrounding communities or community angst or community anger or increased complaints or media attention	10.1 .a Stakeholder Engagement Plan has been developed 10.1 b Existing Newstan CCC established.	B (D)	4 (R)	14 (S)	18. Undertake a social impact assessment for the proposed Project 19. Update the Stakeholder Engagement Plan 20. Develop and distribute a Newstan Colliery newsletter

RISK MANAGEMENT STANDARD

Management Standard-004

CENTENNIAL RISK MATRIX						Likelihood					Description (D)
						A Certain	B Probable	C Possible	D Remote	E Improbable	
Rating	Consequence					Common"	Has Happened within Centennial"	"Could Happen & has happened in non-CEY operations	Not Likely	"Practically impossible	Probability (Pb)
	Note: Consequence may result from a single event or may represent a cumulative impact over a period of 12 months. Use the worst case reasonable consequence if there is more than one.					Frequent incidents	Regular incidents	Infrequent incidents	Unlikely to occur. Very few recorded or known incidents	May occur in exceptional circumstances. Almost no recorded incidents.	Incident Frequency (IF)
	Impact to Annual Business Plan (F)	Personal Injury (PI)	Business Interruption (BI)	Legal (L)	Reputation (R)	Environment (E)					
1. Catastrophic	>\$50m	Multiple Fatalities	> 1month	Prolonged litigation, heavy fines, potential jail term	Prolonged International media attention	Long term impairment habitats/ ecosystem	1 (E)	2 (E)	5 (H)	7 (H)	11 (S)
2. Major	\$10m - \$50m	Single Fatality	1 week to 1 month	Major breach/ major litigation	International media attention	Long term effects of ecosystem	3 (E)	4 (E)	8 (H)	12 (S)	16 (M)
3. Moderate	\$1m - \$10m	Serious/ Disabling Injury	1 day to 1 week	Serious breach of regulation. prosecution/ fine	National media attention	Serious medium term environmental effects	6 (H)	9 (H)	13 (S)	17 (M)	20 (L)
4. Minor	\$100k - \$1m	Lost Time Injury	12 hrs to 1 day	Non-compliance, breaches in regulation	Adverse local public attention	Minor effects to physical environment	10 (S)	14 (S)	18 (M)	21 (L)	23 (L)
5. Insignificant	<\$100k	First Aid Treatment Only	< 12 hrs	Low level compliance issue	Local complaints	Limited physical damage	15 (S)	19 (M)	22 (L)	24 (L)	25 (L)

Risk Rating	Risk Category	Generic Management Actions
1 to 4	E	Immediate intervention required from senior management to eliminate or reduce this risk
5 to 9	H	Imperative to eliminate or reduce risk to a lower level by the introduction of control measures. Management planning required at senior levels
10 to 15	S	Corrective action required, senior management attention needed to eliminate or reduce risk
16 to 19	M	Corrective action to be determined, management responsibility must be specified
20 to 25	L	Monitor and manage by corrective action where practicable

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BOW TIE ANALYSIS Control Effectiveness Matrix		CONTROL – Impact / Status / Quality				
		A >= 80%	B 50 – 80%	C 50 / 50%	D 50 – 20%	E <= 20%
TYPE OF CONTROL	1. Elimination of hazard					
	2. Substitution					
	3. Engineered without people					
	4. Engineered with people					
	5. Procedural					
	6. Awareness					