RESPONSE TO SUBMISSIONS REPORT - PART A

Felix Resources Ltd

Moolarben Coal Project – Stage 2

July 2009

CR 6015_4_v2

FELIX RESOURCES

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SPECIALISTS IN PEOPLE AND PLACE

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Moolarben Coal Project – Stage 2

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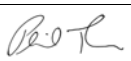
CR 6015_4_v1	Final for distribution		9 June 2009
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CONTENTS

Tables

Appendices

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1. INTRODUCTION

Moolarben Coal Mines Pty Limited (Moolarben Coal Mines, MCM), the proponent for the project, seeks approval in terms of Part 3A of the *Environmental Planning and Assessment Act 1979* (the Act) for the development of the Stage 2 Project (08_0135) and Modification to Stage 1 (05_0117 MOD 3) of the Moolarben Coal Project (MCP) in the Western Coalfields of New South Wales (NSW). The proposed Stage 2 Project (Stage 2) comprises one open cut and two underground coal mines, and supporting infrastructure and facilities. These will be developed adjacent to the Stage 1 Project (Stage 1), which was approved by the NSW Minister for Planning on 6 September 2007. When developed, both stages of MCP will form an integrated mining complex with employees, equipment, infrastructure and facilities shared across the complex. To enable this integration, certain aspects of the Stage 1 Project Approval, specifically relating to the rail loop, need to be modified. MCM is seeking approval for both Stage 2 and the proposed modification of the Stage 1 Project Approval.

In July 2008, MCM lodged a Major Project Application and Preliminary Environmental Assessment with the NSW Department of Planning (DoP) for Stage 2 of the MCP. Following lodgment of the Major Project Application, MCM notified the public of its intentions to develop Stage 2 by the placement of notices in *The Australian* and the *Mudgee Guardian* newspapers on 21 July 2008. On 11 September 2008, the DoP issued the Director-General's Requirements for the environmental assessment.

An Environmental Assessment (EA) report was subsequently prepared to address the Director-General of Planning's Environmental Assessment Requirements for assessment of the potential environmental, social and economic impacts of Stage 2 and the modification of Stage 1. The EA was submitted to the DoP and the EA was then placed on public exhibition from 18 March 2009 until 29 April 2009. Stakeholders, including government agencies and members of the public, were invited to comment on the proposed project.

Submissions from stakeholders were received by the DoP and forwarded to MCM. Moolarben Coal Mines, with assistance from Coffey Natural Systems and, where applicable, the specialist consultants have reviewed the submissions and compiled this Response to Submissions Report in accordance with Section 75H(6) of the Act. This report responds to issues raised during the public exhibition of the Stage 2 and modification to Stage 1 EA. This document forms Part A of that report.

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2. SUMMARY OF SUBMISSIONS

One hundred seventy-seven submissions from stakeholders were received and forwarded to MCM for consideration. This included 80 submissions in support, 90 submissions objecting to or raising issues of concern and seven submissions from government agencies. These stakeholders included:

- Government agencies (7 submissions):
  - NSW Department of Environment and Climate Change (DECC).
  - NSW Department of Primary Industries (DPI).
  - NSW Department of Water and Energy (DWE).
  - NSW Roads and Traffic Authority (RTA).
  - Mid-Western Regional Council (MWRC).
  - Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA).
  - Hunter-Central Rivers Catchment Management Authority (CMA).
- Corporate (1 submission).
- Special interest community groups (14 submissions).
- General public (155 submissions).

Moolarben Coal Mines would like to acknowledge and thank all stakeholders for taking the time to review the EA and for submitting a response. All submissions which raised issues or concerns were comprehensively reviewed. Specific issues identified within each submission were grouped under the most relevant environmental aspect category (e.g., air quality, transport). Issues that could not be grouped under an appropriate environmental aspect category were grouped under the 'Other' category. A detailed response, cross referenced where necessary to the applicable section of the EA, was then compiled for each issue. Table 2.1 identifies the environmental aspect categories raised in each submission. Figure 2.1 presents the number of submissions by category of issue (some submissions fall under more than one category). Table 2.2 lists the issues in each environmental aspect category for which responses were compiled. Appendix 1 presents the in-text references for specific issues raised by each submission.

This document forms Part A of the Response to Submissions Report and responds to issues raised under the Air Quality, Greenhouse Gas, Blasting, Aboriginal Heritage, Non-Aboriginal Heritage. Transport, Visual Amenity and Landscape, Social and Economic, Land Use, Rehabilitation, Mine Closure and Other categories. Moolarben Coal Mines is currently working on responses to issues raised on Noise (including vibration), Groundwater, Surface Water and Creek Realignments, Water Demand and Supply, Ecology and Subsidence categories. These responses will form Part B of the Response to Submissions Report.

Table 2.1 Categorisation of issues by submission

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Government Agency																	
Department of Environment of Climate Change	●		●		●		●		●								
Department of Water and Energy				●	●	●											
Department of Primary Industries								●								●	
Department of the Environment, Water and Heritage							●										
Hunter-Rivers Catchment Management Authority				●	●		●		●								●
Mid-Western Regional Council	●		●	●	●	●	●		●	●	●	●	●				
Roads and Traffic Authority											●						
Corporate																	
Xstrata Coal	●		●	●	●						●						●

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Individuals																	
Adler, N.							●		●	●		●					
Albury, A.			●		●		●	●				●	●		●		
Ambler, S.		●		●	●		●		●				●	●			
Anderson, M	●		●	●	●	●	●		●	●		●	●				
Arnott, W. and Pavich, C.	●	●	●	●	●		●		●				●				
Atkinson, B.		●															
Barlow, C.	●		●	●	●	●	●		●				●				
Barlow, D.		●															
Batey, L.			●														●
Bick, G.		●					●		●	●		●					
Binns, B.	●	●	●	●	●	●	●		●				●				

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Individuals (cont'd)																	
Brasseur, E.	●	●	●	●	●		●					●	●				
Cleary, M.		●					●						●				
Day, S.		●															
Dunphy, D.		●															
Ealing, L.		●			●		●						●				
Ellis, J.		●											●				
Gant, L.							●		●	●			●				
Goonrey, T.	●	●	●	●	●	●	●		●				●				
Goulburn River Stone Cottages	●	●	●	●	●		●	●	●	●	●	●	●				
Haines, A.		●		●	●	●	●		●								
Handicott, F.	●		●								●						

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Individuals (cont'd)																	
Harris, J.							●						●				
Hefford, L.							●		●	●		●					
Higgins, B. and M.							●		●	●		●					
Hope, M.							●										
Hulme, J.	●	●	●	●	●	●	●	●	●				●				
Imrie, C.		●		●	●		●		●	●		●	●	●			●
Imrie, J.		●		●	●	●	●		●	●		●					●
Imrie, T.		●		●	●		●	●	●	●		●	●				
Jan, B.		●		●	●		●	●	●	●		●	●				
Jury, F.		●															
Kingston, P.							●		●	●		●					

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Individuals (cont'd)																	
Lawson, J.		●					●		●	●		●	●				
Lewis, J.	●	●	●	●	●	●	●		●				●				
Lewis, S.	●	●	●	●	●	●	●		●			●	●				
Lloyd, R.							●						●				
Luckhurst, F.	●		●	●	●	●	●		●				●				
MacLeod, M.	●	●	●	●	●	●	●		●				●				
Madigan, R.		●															
Mayberry, K.	●		●	●	●		●							●			
M^{c}Guire, T.		●															
M^{c}Phee, J. and K.				●	●		●	●	●	●		●					
More, J.							●										

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Individuals (cont'd)																	
Munro, S.	●	●	●	●	●	●	●		●				●				
Mushalik, M.		●															
Nutting, B.							●										
O'Connor, F.		●										●	●	●	●		
O'Mara, D. and P.	●	●	●	●	●		●	●	●	●			●				
O'Neill, R. and S.	●	●	●	●	●	●	●		●			●	●				
Pattulo, C. (on behalf of Cumbo Creek valley residents)	●		●										●				
Peters, A.		●			●		●										
Rayner, D.														●			
Rose, P.		●															

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Individuals (cont'd)																	
Ryan, C.		●															
Stanford, R.							●										
Schofield, N.		●							●	●		●					
Sedgwick, P.		●															
Sellers, C.		●															
Setchell, P.	●	●	●	●	●		●		●				●	●			
Stone, K.	●	●	●	●	●		●		●								
Swords, H and M.	●		●	●	●		●	●	●	●	●	●	●	●	●		●
Symons, S.	●	●	●				●				●	●	●	●	●		
Thomson, B.	●	●	●	●	●	●	●		●				●				
Tuck-Lee, G.													●				

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Individuals (cont'd)																	
Tyler-Olsen, L.		●															
Wales, W.	●	●	●	●	●	●	●		●			●	●				
Walsh, R.			●										●				
Walter, I.	●	●	●	●	●	●	●		●				●				
Watson, K. and S.							●										
Whalley, B.				●	●												
White, W.	●	●	●		●		●		●			●	●				
Wiggins, S.		●					●		●	●		●					
Woodhead, A. and L.	●		●	●	●		●				●	●					
Wright, C. and Mobbs, P.	●	●	●	●	●	●	●	●	●		●		●				

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Special Interest Groups																	
Bathurst Community Climate Action Network Inc.	●	●	●	●	●	●	●		●				●				
Central West Environment Council	●		●				●		●				●				●
The Greens NSW		●		●	●	●	●	●	●								
Hunter Environment Lobby Inc.	●		●		●	●	●		●		●	●	●				●
Johnsons Creek Conservation Committee Inc.	●	●	●	●	●	●	●	●	●				●				
Joint Climate Action Groups	●	●	●	●	●	●	●		●				●				●
Mudgee District Environment Group	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●
Minewatch NSW Inc.	●	●	●	●	●		●						●				
National Parks Association of NSW	●	●	●	●	●		●	●	●	●		●					
Nature Conservation Council of NSW		●	●	●	●	●	●	●	●				●				
Orange Field Naturalist and Conservation Society Inc.	●	●	●	●	●		●		●								

Table 2.1 Categorisation of issues by submission (cont'd)

Submissions Received	Category of Issue Raised																
	Air Quality	Greenhouse Gas	Noise and Blasting	Groundwater	Surface Water and Creek Realignments	Water Demand and Supply	Ecology	Subsidence	Aboriginal Heritage	Non-Aboriginal Heritage	Transport	Visual Amenity and Landscape	Social and Economic	Land Use	Rehabilitation	Mine Closure	Other
Special Interest Groups (cont'd)																	
Orange Climate Change Action Now		●															
Rivers SOS				●	●		●										
The Wilderness Society		●					●		●				●				
Total	40	59	44	46	52	26	69	15	52	20	11	29	49	10	5	2	10

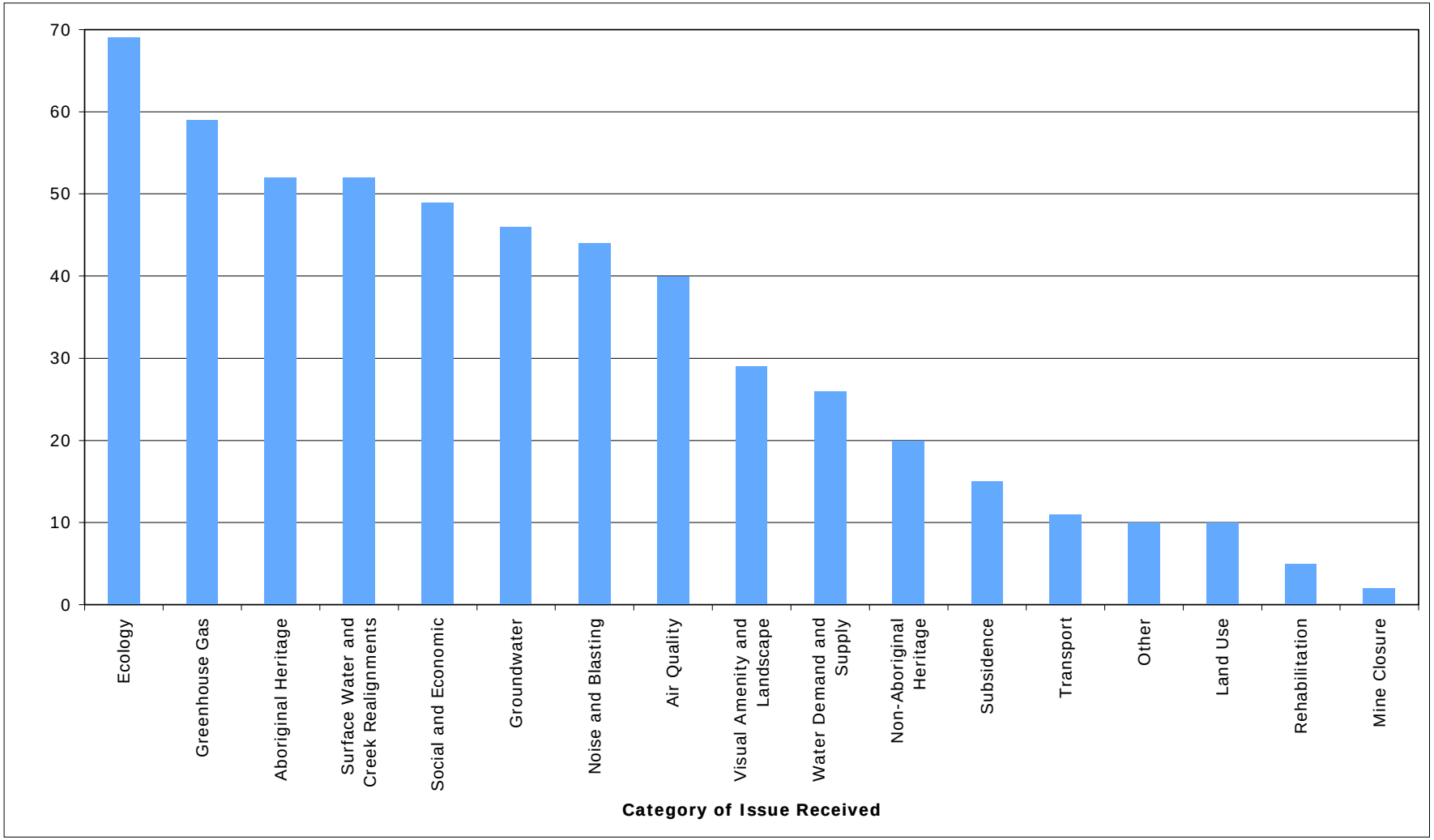

Figure 2.1 Number of submissions by category

Table 2.2 Summary of issues raised

Category	Issue	Section
Air Quality	The Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DECC, 2005) specifies the methodology for conducting cumulative impact assessments. The background concentration can be accounted for in the assessment by two methods: 1. Assuming the maximum concentration of the pollutant being assessed for the relevant averaging period from available ambient monitoring data; or 2. Conducting a contemporaneous assessment where ambient monitoring data is obtained that is contemporaneous with the meteorological data used in the assessment and at each receptor, each individual dispersion model prediction is added to the corresponding measured background concentration to obtain hourly predictions of total impact.	3.1.1
	An assessment of the background concentration in the assessment of 24-hour average PM_{10} impacts has not been undertaken.	
	There has been no assessment of baseline dust in the northern section of EL6288.	
	There is the potential for increased (compared to Stage 1 and cumulative with surrounding mines) dust impacts on the community and local environment (including the Goulburn River National Park and Munghorn Gap Nature Reserve, a long standing area for bird research).	3.1.2
	There is no discussion of cumulative increased dust levels on adjacent reserves.	
	The dust impacts from Stage 1 are yet to be realised and Stage 2 will result in impacts on top of these.	
	The statement that 'reduced off-site noise and dust impacts from Stage 2 will be achieved because Stage 2 impacts will be effectively buffered by the land occupied by Stage 1' is highly questionable. This statement fails to take into account the cumulative impacts of neighbouring coal mines.	
	The size of the disturbance in OC4, length of haul roads, additional movements of coal around the site, in conjunction with the existing operations will have a cumulative impact on air quality.	
	Adverse dust impacts may occur at additional private residences when issues which may underestimate impacts are taken into account.	
	Property 23 was identified in the EA as likely to be subject to exceedances of dust, an issue that the residents (Woodhead) had raised in their first submission. They feel they have been denied the right to independent monitoring because the exceedance was predicted by the mining company.	
	The EA does not provide any data to validate the assumption that chemical dust suppressants on trafficked areas will result in an 85% reduction in dust emissions.	3.1.3

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Air Quality (cont'd)	Chemical dust suppressants have not been used widely in NSW. The crusting agents are broken up when driven over and are also soluble in light rain. The application of chemical dust suppressants requires constant application. The EA contains no discussion around the management of these issues in relation to managing increased dust levels in the local area.	3.1.3
	In the draft statement of commitments for Stage 2 works, MCM has committed to 'accept an obligation to purchase (if so requested by **any** affected private landholder under the conditions of the Stage 2 Approval) **any** land at which noise or air quality limits determined in the Stage 2 Approval trigger such an obligation, due to the operation of the MCP' (EA Section 6.6.6, DECC emphasis added).	
	The DECC considers that there are a number of additional properties that may be affected by dust should chemical dust suppression not be as effective in practice as in theory and winds predominate from the northeast.	
	The DECC recommends the development of a reactive dust management strategy, including specific trigger levels, be formalised in the recommended conditions of approval. These conditions should include an assessment of the effectiveness of chemical dust suppressants.	3.1.4
	Blasting in certain meteorological conditions can lead to significant off-site dust impacts on residences and the Munghorn Gap Nature Reserve. The DECC recommends that MCM commit to the implementation of a blast dust management protocol that outlines the meteorological conditions during which blasting may only occur, which will ensure that the blast-generated dust is limited.	3.1.5
	It would be ideal for MCM to analyse wind direction patterns over a longer duration dataset, preferably at least five years to determine if there is a dominant pattern. The use of the 2005 dataset in the modelling may have underestimated potential impacts at residences to the west and southwest of the site. As such, the DECC recommends that MCP continue to operate WS1 (weather station no. 1) and WS2 (weather station no. 2) in their present locations.	3.1.6
	The DECC recommends that MCM identifies and establishes dust monitor TEOM 2 in a location representative of the residential areas to the west and southwest of the Project Area.	
	Additional dust deposition monitoring should be undertaken at the Aboriginal rock art shelter located above UG2 (DM10) and in the Munghorn Gap Nature Reserve (DM11).	
	An appropriate monitoring network should be established by MCM to allow for the distinction between the MCP and other surrounding operations regarding the source of dust emissions.	

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Air Quality (cont'd)	The DECC proposes the following amendments to the draft statement of commitments regarding air quality: – Windblown dust control procedures as outlined in Table 14 on page 42 of the Holmes Air Sciences report of 5 March 2009 (EA Appendix 3A) will be undertaken. – Additional TEOM and meteorological stations will be installed as required by the Department. – Unfavourable meteorological conditions will be determined during which blasting will not occur.	3.1.7
	The DECC recommends that the following special conditions are applied: 1. A dynamic dust management plan must be maintained and developed on an ongoing basis for the site which addresses the following: – The minimum aim of the plan must be to achieve and demonstrate best management dust control practice for the mine. – Effective reactive management of activities on the mine in response to the results of measured real-time PM_{10} and other inputs (trigger levels). The reactive management strategy must aim to control PM_{10} (and/or other dust) levels due to the mine at receiver locations. – Detail of the identification and establishment of a minimum of one TEOM monitor at a location representative of residences to the west and southwest of the project site. – Commit to a minimum of one review of the effectiveness of the dust management plan after twelve months. – A commitment to updating the plan and the management of all relevant activities on the site in accordance with the findings of any review of the plan. – Availability of the plan to the DECC upon request. – The implementation of all actions specified in the plan must be in the course of routine operation of the site. 2. An investigation by a suitably qualified person must be undertaken within 3 months of project approval to establish readily identifiable indicators of 85% control of dust by watering of and use of chemical dust suppressants on trafficked areas. A report is to be provided to the DECC upon completion. The indicators identified in the study are to be incorporated in the mine's best practice dust management plan at 1 above.	3.1.8
	The EA does not indicate the possibility of spontaneous combustion occurring in the Stage 2 overburden stockpiles. Both Wilpinjong and Ulan coal mines have had this issue and the MCP will be sourcing coal from the same coal seam.	3.1.9
	The suggestion that coal will be left in stockpiles for longer than two weeks is highly optimistic. This would depend on economic circumstances and availability of access to rail and port facilities.	

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Air Quality (cont'd)	There is no consideration of spontaneous combustion occurring in overburden emplacements or open cut backfills. These are the areas where Wilpinjong and Ulan coal mines have experienced management problems with spontaneous combustion.	3.1.9
Greenhouse Gas	Arguments regarding the significance of greenhouse gas emissions from the project are based on a bizarre set of calculations and claim that the effect of a given quantity of greenhouse gases to the atmosphere is less and less as the concentration becomes higher and higher.	3.2.1
	The EA only takes into account the emissions generated by diesel fuel consumption and electricity used on the site. It does not include the emissions produced by the coal that is mined.	
	The EA does not provide a quantitative assessment of potential greenhouse gas emissions from spontaneous combustion.	
	The Greenhouse Gas Assessment report (EA Appendix 3B) incorrectly calculates the Scope 1 emissions by including spontaneous combustion emissions as Scope 3 emissions.	
	The Greenhouse Gas Assessment is presented as a revised assessment of Stage 1, therefore consideration of spontaneous combustion and other Scope 1 emissions for the entire operation have not been accurately assessed.	
	There is no consideration in the Scope 1 calculations of the emissions from low-temperature oxidation of waste coal in spoil piles[1].	
	The Greenhouse Gas Assessment report (EA Appendix 3B) does not include greenhouse gas emissions sourced from exposed tailings in the calculations.	
	The use of the coal for electrical power generation produces carbon dioxide, a greenhouse gas, and therefore contributes to climate change. Specifically, the expanded mine will produce 700 or 800 million tonnes (Mt) of CO_2-e, which is 1.5 times Australia's net yearly emissions.	3.2.2
	The projected contribution of the MCP to rising global temperatures is very significant, especially given that this, after all, is but one coal mining project in Australia.	
	It is refuted that the MCP's contribution to greenhouse gas emissions will be statistically insignificant.	

[1] Carras, J.N., Day, S.J., Saghafi, A. and Williams, D.J. 2008. Greenhouse gas emissions from low-temperature oxidation and spontaneous combustion at open-cut coal mines in Australia. CSIRO.

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Greenhouse Gas (cont'd)	Greenhouse emissions violate NSW Government's Ecologically Sustainable Development (ESD) Principles as the impacts of burning coal are potentially irreversible and pose substantial intergenerational environmental stress.	3.2.2
	As a result of climate change, to which the project is contributing, there will be increased bushfire risk; Ridge Road was identified by the NSW Rural Fire Service as the most vulnerable high casualty area in the State.	3.2.3
	The recently released DECC report on climate change in the Upper Hunter predicts a significant decrease in rainfall and runoff. The impact of this decrease will begin to be felt during the life of this mining proposal. There is no indication that the models used to predict water impacts have taken this decrease into account.	
	The government and/or community should retain the right to revoke the approval to mine this publicly-owned coal resource (with no compensation), if, within a reasonable time (5 to 10 years), the coal is not being used in an ecologically sustainable carbon capture and storage system.	3.2.4
	The public, who must bear the consequences of this approval, should retain the right to seek action for damages (relating to greenhouse gases).	
Noise	Noise (and vibration) issues and responses to these issues will be included in the Response to Submissions Report – Part B.	Addressed in Part B
Blasting	Blasting will occur up to six times a day (and up to 23 blasts per week) from Wilpinjong coal mine and Stages 1 and 2 of the MCP.	3.3.1
	There is an increased potential for further disturbance from blasting on the local community, flora and fauna.	
	There will be an increased risk to the structural integrity of local residences, buildings and sensitive natural features (such as the sandstone overhangs). Households are experiencing blasting damage in excess of 2 km from the Wilpinjong coal mine.	
	The impact of noise exceedances on the Munghorn Gap Nature Reserve and potential mitigation measures have not been adequately addressed and the proposed 20 m buffer between the mine and the reserve for OC4 is highly inadequate.	
	There will be an increase in the quantity of toxic gases released into the atmosphere, which will impact on both human and animal health.	
	The DECC considers that ground vibration and overpressure monitoring should be undertaken at the nearest non mine-owned residence (not the subject of a private agreement) and noise sensitive location, and when blasting is within 1 km of the Aboriginal rock art site above UG2.	3.3.2

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Blasting (cont'd)	The DECC recommends that MCM commits to: – Limiting the maximum instantaneous charge (MIC) of blasts to 1,788 kg. – Limiting blasts, where the MIC exceeds 400 kg, to one blast per week when averaged over a 12-month period.	3.3.2
Groundwater	Groundwater issues and responses to these issues will be included in the Response to Submissions Report – Part B.	Addressed in Part B
Surface Water and Creek Realignments	Surface water issues and responses to these issues will be included in the Response to Submissions Report – Part B..	Addressed in Part B
Water Demand and Supply	Issues relating to surface water and the realignments of the creeks and responses to these issues will be included in the Response to Submissions Report – Part B.	Addressed in Part B
Ecology	Ecology issues and responses to these issues will be included in the Response to Submissions Report – Part B.	Addressed in Part B
Subsidence	Subsidence issues and response to these issues will be included in the Response to Submissions Report – Part B.	Addressed in Part B
Aboriginal Heritage	Five high-significance and 16 medium-significance Aboriginal heritage sites should not be removed and two high-significance and seven medium-significance Aboriginal heritage sites should not be disturbed.	3.4.1
	The 55 m buffer distance proposed to protect the Aboriginal artworks in Cliff C7 from subsidence is inadequate.	3.4.2
	Connections with important Aboriginal heritage sites within the Goulburn River National Park and Munghorn Gap Nature Reserve have not been identified in the EA.	3.4.3
	The extent and variety of evidence of Aboriginal connection to the Stage 2 Project Area indicates its importance as a repository of cultural heritage and that important linkages need to be better understood and should not be destroyed.	3.4.4
	Heritage conservation areas should be provided to offset the loss of Aboriginal heritage sites in the Murragamba Creek valley.	
	An agreement should be made to protect the conservation areas in perpetuity.	
	Adequate mapping is required to determine where the proposed conservation areas are, and to determine whether the proposed conservation areas are the same as those proposed as offset areas for Stage 1.	

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Aboriginal Heritage (cont'd)	The cumulative impacts on Aboriginal cultural heritage in the region have not been assessed.	3.4.5
	The cumulative impact is not clearly aggregated or identified as a total loss in the Aboriginal cultural heritage assessment.	
	The conclusions of the cumulative impact assessment are not identified in the management measures or statement of commitments.	
	The DECC acknowledges that consultation with the Aboriginal community has been undertaken. However, it believes there have been no attempts to properly list the concerns raised, discuss the merits of these and provide a response. It further believes that as part of the consultation process, the Aboriginal community was not provided an opportunity to review and provide comment on the Aboriginal cultural heritage assessment report and, as such, the recommendations of the report may not concur with the wishes of the Aboriginal community.	3.4.6
Non-Aboriginal Heritage	The Brett Whitely mural is of cultural significance and should be protected from the impacts of mining.	3.5.1
Transport	Road usage and proposed traffic movements associated with Stage 2 need to be clarified.	3.6.1
	Mid-Western Regional Council raised concern that the proposal will generate traffic movements, which would equate to 800 additional movements created by Stages 1 and 2 of the MCP and the Wilpinjong coal mine.	
	The road traffic assessment does not appear to consider traffic generated from Ulan Coal Mine Limited's (UCML) existing and currently approved operations.	
	The RTA states that traffic volumes and road crash data should be collected and assessed every two years throughout the project's construction and operation to ensure road safety and traffic measures are operating as intended and that no other major changes in the area have affected safe and efficient traffic operation.	
	While the EA outlined the extension of the construction period from two to six years, it did not outline how this might affect traffic.	3.6.2
	There is the potential for increased traffic on local roads (e.g., Cassilis-Ulan Road), leading to unsafe driving and overtaking. Contrary to what the EA says, Ulan Road is not capable of coping with an increased traffic flow of cars and heavy and wide load vehicles.	3.6.3
	Mid-Western Regional Council raised concern with the estimated increase in traffic load associated with Stages 1 and 2 and Wilpinjong coal mine, resulting in an additional 3.9 crashes per year.	
	Mid-Western Regional Council requested that MCM make additional contributions specific to road upgrades of $200,000 for the intersection of Ulan Road and Wollar Road and $150,000 for the intersection of Ulan Road and Mud Hut Creek Road.	

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Transport (cont'd)	There is a potential for the cumulative increase of train movements and coal handling on the Gulgong-Sandy Hollow rail line to impact on the community from Ulan to Newcastle.	3.6.4
	There will be an increase in noise levels from coal trains travelling through Mudgee and Gulgong to Lithgow.	
Visual Amenity and Landscape	Stage 2 will cause the loss of aesthetic value of the local environment, landscape and catchment (including the Goulburn River).	3.7.1
	The lighting impacts from Stage 2 will extend and spread the overall lighting changes over a wide area and therefore increase the cumulative impact of lighting on the rural landscape.	3.7.2
	The significant impact of the large overburden emplacements as permanent changes to the landscape adjacent to Munghorn Gap Nature Reserve has not been addressed.	3.7.3
Social and Economic	The project will lead to a depopulation of the area with a subsequent loss of: – Community or social fabric. – Organisations providing voluntary services to the wider community, e.g., fire-fighting and religious services.	3.8.1
	The socio-economic assessment has not valued the ecosystem services that will be destroyed by the mine.	3.8.2
	Moolarben Coal Mines interacted poorly with the community in relation to community consultation and complaints.	3.8.3
	Mining will be a source of health deterioration and stress to local residents.	3.8.4
	The EA did not adequately consider the impacts on housing and social services, such as medical facilities and schools, due to the introduction of a new population of workers and their families to Mudgee and Gulgong, nor did it assess the cumulative impact of these pressures in relation to Wilpinjong coal mine and Stage 1 operations.	3.8.5
	Employment and investment should be directed to other types of industries or energy sources (e.g., renewable energy sources).	3.8.6
	Economic benefits to the region, state, and federal governments outlined in the Stage 1 EA report have yet to commence.	
	The MCP will have a permanent detrimental impact on existing tourism and the potential for tourism in the local area.	3.8.7
	Additional mining operations will compromise the great potential of the fertile valley to be a major tourism area.	
	The MCP will have a permanent detrimental impact on the Goulburn River Stone Cottages, an ecotourism business.	
	The MCP will result in the loss of tourism access to the Goulburn River Gorge.	

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Social and Economic (cont'd)	The local area will be subject to rapid growth with the uncontrolled frenzy of mining before becoming a ghost town.	3.8.8
	Social impacts from Stage 1 have yet to be tested.	3.8.9
	Felix Resources did not list their donations to political parties in any of the documents on public exhibition.	3.8.10
	The voluntary planning agreement (VPA) offered for Stage 2 is in staged payments with payments not commencing until after the combined mining operations reach 10 Mtpa coal production.	3.8.11
	The VPA is highly inadequate and does not compensate for the additional impact to the amenity of the area should 10 Mtpa production not be reached.	
Land Use	Additional mining operations will compromise the great potential of the fertile valley to be a major agricultural production area.	3.9.1
Rehabilitation	Current coal mining methods remove the top layer of soil, leaving unattractive landscapes that are useless for crops, vines, raising thoroughbreds or attracting tourists.	3.10.1
Mine Closure	The DPI notes that Wilpinjong coal mine and Stage 2 propose final voids in close proximity to each other and recommends that MCM coordinate with Wilpinjong coal mine to ensure that only one void exists at the end of mining.	3.11.1
	The long-term rehabilitation of subsided land across the region does not appear in any of the mitigation or mine closure plans.	
Other	It is difficult to locate specific properties in EA Plan 2 and property ownership is not listed alphabetically or numerically.	3.12.1
	The DPI states that the risk analysis does not indicate what constitutes an unacceptable risk.	3.12.2
	The EA fails to address the Director-General's Requirements to include 'any cumulative impacts associated with concurrent operations of the project with any other existing or approved mining operations in the region'.	3.12.3
	The EA attempts to dismiss cumulative impacts by identifying the region as being primarily a mining landscape and therefore not worth consideration.	
	There is potential conflict in the application for a mining lease (MLA331) over the Corner Gorge, Goulburn River (EL 7074 – 35 ha), an area previously identified by the Independent Hearing and Assessment Panel (IHAP) report as part of a protective buffer zone for this gorge. As a result of IHAP recommendations, MCM agreed to increase the buffer zone between the mine workings and Corner Gorge to 450 m. ML331 contradicts that undertaking.	3.12.4

Table 2.2 Summary of issues raised (cont'd)

Category	Issue	Section
Other (cont'd)	Mining Lease 331 presumes development approval when the MCM Stage 2 – No: 08_0135 (and Modification Stage 1 – No: 05_0117 MOD 3) is still currently being assessed by the DoP and the DECC. This mining lease should be not considered by the DPI-Mineral Resources (DPI-MR) before the DoP has been able to complete both a rigorous and transparent process that would include, should an approval be granted, extensive conditions of consent that may have a significant affect on any mining lease boundary.	3.12.4 (cont'd)
	A senior Planning Department officer is a consultant for MCM apparently to use contacts and experience in framing the company's response to our objections.	3.12.5
	The DPI state that the existence of previous mining should not be allowed to be a reason to increase mining impacts on the landscape. This reasoning contradicts cumulative impact and ESD principles.	3.12.6
	The hours to be worked during the construction phase of Stage 2 needs clarification.	3.12.7
	Moolarben Coal Mine proposes to conduct a number of mining and related activities associated with the MCP on UCML-owned land.	3.12.8
	The proposed development will make accessing private land holdings in the Murragamba Creek valley more difficult.	3.12.9
	Various impact assessments from the EA (including air quality, noise and rail traffic) did not consider the Ulan Continued Operations Project.	3.12.10
	The EA does not apply the precautionary principle.	3.12.11
	Project alternatives analysed in EA Section 7.3.5 are based on cost rather than mitigation of irreversible environmental damage.	3.12.12
	The EA does not explain why Stage 2 has such a large ratio of coal reject (i.e., 5 Mtpa run-of-mine (ROM) coal to produce 3 Mtpa saleable product). This indicates that the coal being mined in Stage 2 is of questionable quality.	3.12.13
	The entire justification for Stage 2 is based on economic arguments in favour of the proponent and shareholders. The points in EA Section 7.3.1 do not indicate why Stage 1 does not give flexibility in delivery of different product coals with differing ash contents or why Stage 1 does not meet contractual obligations as an equity participant in the Newcastle Coal Infrastructure Group (NCIG).	3.12.14

3. RESPONSE TO SUBMISSIONS

3.1 Air Quality

3.1.1 Assessment Method

Issues

- The Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DECC, 2005) specifies the methodology for conducting cumulative impact assessments. The background concentration can be accounted for in the assessment by two methods:

  1. Assuming the maximum concentration of the pollutant being assessed for the relevant averaging period from available ambient monitoring data; or

  2. Conducting a contemporaneous assessment where ambient monitoring data is obtained that is contemporaneous with the meteorological data used in the assessment and at each receptor, each individual dispersion model prediction is added to the corresponding measured background concentration to obtain hourly predictions of total impact.

- An assessment of the background concentration in the assessment of 24-hour average PM_{10} impacts has not been undertaken.

- There has been no assessment of baseline dust in the northern section of EL6288.

Response

There are practical difficulties in applying the procedures outlined in The Approved Methods for the Modelling and Assessment of Air Pollutants in NSW to coal mines and similar projects. These arise because of the very large areas that need to be considered for mine assessments and there are also some difficulties in the application regardless of the type of project.

Method 1 (above) assumes that the background 24-hour average PM_{10} concentration can be represented by a single figure for all sensitive locations around the mine. This is not realistic particularly in areas, such as the MCP area, where existing natural and anthropogenic (including roads, agriculture and mining) dust emissions affect the spatial distribution of dust.

The maximum 24-hour average PM_{10} concentration measured in the MCP area, as part of background monitoring for the project over 18 months, is 44.5 $\mu g/m^3$ (EA Appendix 3A Section 4.2). This would be the current single value background 24-hour average PM_{10} concentration for the MCP if Method 1 is used. Given a longer monitoring period, it is likely that the 50 $\mu g/m^3$ 24-hour average PM_{10} concentration criteria would be exceeded at the MCP. This is expected to occur in almost any part of Australia, including the major cities and suburban areas. In recent years, the prime causes of 24-hour average PM_{10} concentrations above the 50 $\mu g/m^3$ in NSW has been smoke from bushfires.

When the modelled 24-hour average PM_{10} contribution from the mine is greater than 5.5 $\mu g/m^3$, addition of the maximum 24-hour average background PM_{10} concentration of 44.5 $\mu g/m^3$ (Method 1) will result in an exceedence of the 24-hour average PM_{10} dust criteria. This is not a realistic model of the predicted dust impacts.

Method 2 (above) requires contemporaneous measurements of the 24-hour average PM_{10} concentrations and meteorological conditions. These observed 24-hour average PM_{10} concentrations are assumed to apply to all locations within the assessment area and the predicted 24-hour average PM_{10} concentrations for each day are added to the observed concentrations to obtain the expected cumulative concentrations. This assumes that the spatial distribution of the background PM_{10} concentrations is uniform.

Contemporaneous measurements of 24-hour average PM_{10} concentrations and meteorological conditions do not exist for the MCP. Even if this data was available from one point, it would only represent the conditions at this location and would not be representative of the project area as a whole. This could only be achieved with a large number (more than ten) of combined meteorological and continuous PM_{10} dust monitors. This is not practical and to our understanding has not been undertaken by any broad scale project in NSW.

The dust management measures to prevent exceedence of dust criteria are described in EA Section 5.1.7 and reactive dust management trigger values are described in Section 3.1.4 below. These measures will take into account the effect of emissions from the mine as well as background dust concentrations on any given day.

The residence in the northern section of EL6288 (property 11, see EA Plans 2 and 2A) is approximately 6 km north of any dust generating activities from Stage 2. Baseline dust measurements closer to the mine were used in the air quality assessment.

3.1.2 Potential Dust Impacts

Issues

- There is no discussion of cumulative increased dust levels on adjacent reserves.
- The dust impacts from Stage 1 are yet to be realised and Stage 2 will result in impacts on top of these.
- The statement that ‘reduced off-site noise and dust impacts from Stage 2 will be achieved because Stage 2 impacts will be effectively buffered by the land occupied by Stage 1’ is highly questionable. This statement fails to take into account the cumulative impacts of neighbouring coal mines.
- The size of the disturbance in OC4, length of haul roads, additional movements of coal around the site, in conjunction with the existing operations will have a cumulative impact on air quality.
- Adverse dust impacts may occur at additional private residences when issues which may underestimate impacts are taken into account.
- Property 23 was identified in the EA as likely to be subject to exceedances of dust, an issue that the residents (Woodhead) had raised in their first submission. They feel they have been denied the right to independent monitoring because the exceedance was predicted by the mining company.
- There is the potential for increased (compared to Stage 1 and cumulative with surrounding mines) dust impacts on the community and local environment (including the Goulburn River National Park and Munghorn Gap Nature Reserve, a long standing area for bird research).

Response

Air quality modelling took into account the project layout and activities as well as the cumulative impacts from adjacent mines (EA Section 5.1.2 and Appendix 3A). Impacts of dust emissions from the integrated MCP are described in EA Section 5.1.6.1.

A comparison of the predicted exceedences of dust criteria at non mine-owned premises for Stage 1 alone (Wells Environmental Services, 2006) and for the integrated MCP (Stages 1 and 2) are provided in Table 3.1.

Table 3.1 Predicted air quality impacts at non mine-owned premises

Property ID	Project-specific				Cumulative			
	PM_{10} ($\mu g/m^3$)		TSP ($\mu g/m^3$)	Dust Deposition (g/m^2/mth)	PM_{10} ($\mu g/m^3$)		TSP ($\mu g/m^3$)	Dust Deposition (g/m^2/mth)
	Dust Criteria							
	24-hr	Annual	Annual	Annual	24-hr	Annual	Annual	Annual
	50	**30**	**90**	**2**	**150**	**30**	**90**	**4**
25# (Ulan–Mudgee Road)								
Stage 1								
Year 2	**156.9**	28.8	60.9	**3.6**	NA	**44.6**	**100.9**	**5.0**
Year 5	**149.5**	5.1	6.9	0.2	NA	21.7	46.9	1.6
Stages 1 and 2								
Year 2	**60**	7	13	0.7	NA	23	55	2.3
5# (Lagoons Road)								
Stage 1								
Year 8	**91.7**	15.8	33.3	1.9	NA	**32.4**	73.3	3.3
Stages 1 and 2								
Year 7	**66**	14	28	1.5	NA	**30**	69	3.1
Year 12	**98**	13	23	1.2	NA	28	64	3.2
Year 16	**62**	6	9	0.4	NA	23	53	2.1
29A# (Moolarben Road)								
Stage 1								
Year 10	**246.3**	19.1	44.3	**3.2**	NA	**35.7**	84.3	**4.6**
Stages 1 and 2								
Year 12	**80**	6	13	0.9	NA	20	53	2.5
Year 16	**269**	19	45	**3.2**	NA	**35**	88	**4.9**
Year 19†	**57**	5	9	0.7	NA	21	52	2.4
29B# (Moolarben Road)								
Stage 1								
Year 10	**468.4**	59.9	128.3	**7.2**	NA	**76.5**	**168.3**	**8.6**
Stages 1 and 2								
Year 12	**398**	29	69	**4.7**	NA	**43**	**108**	**6.3**
Year 16	**993**	**78**	**187**	**11.9**	NA	**93**	**228**	**13.5**
Year 19†	**164**	13	30	2.0	NA	28	71	3.6

Table 3.1 Predicted air quality impacts at non mine-owned premises (cont'd)

Property ID	Project-specific				Cumulative			
	PM_{10} ($\mu g/m^3$)		TSP ($\mu g/m^3$)	Dust Deposition (g/m^2/mth)	PM_{10} ($\mu g/m^3$)		TSP ($\mu g/m^3$)	Dust Deposition (g/m^2/mth)
	Dust Criteria							
	24-hr	Annual	Annual	Annual	24-hr	Annual	Annual	Annual
	50	30	90	2	150	30	90	4
29# (Moolarben Road)								
Stage 1								
No exceedences predicted								
Stages 1 and 2								
Year 19	**79**	7	14	0.9	NA	21	54	2.5

Private residences that have acquisition rights under the Stage 1 Project Approval.

† Property 29A and property 29B are located within the footprint of OC3 and are likely to be removed by Year 19

Predicted exceedences in **bold**.

As discussed in EA Section 5.1.6.1, dust (and/or noise) criteria were predicted to be exceeded at each of these premises in Stage 1 and as a result, these land owners all have acquisition rights under the Stage 1 Project Approval.

With the exception of property 29B in Year 16 and property 29 in Year 19 of the integrated MCP, criteria are exceeded by less than 10% more for the integrated MCP compared to Stage 1 alone. This is because more stringent dust control measures will be employed for the integrated MCP than were proposed for Stage 1 (see Section 3.1.3). The mine life for Stage 1 open cut operations alone was 11 years while the mine life of the integrated open cut MCP operations is 23 years. Therefore, exceednces of dust criteria are predicted to occur over a longer period for the integrated project.

Dust criteria are not predicted to be exceeded at property 23.

There are currently no air quality assessment criteria applicable to the protection of native vegetation. Land receiving an annual average deposition of 4 g/m^2/month or less is considered suitable for residential land use, which includes growing lawns, flower gardens and vegetable gardens.

Chaston and Doley (2006) examined the effects of dust, overburden and flyash on three type of trees, *Harpullia pendula* (brown tulip oak), *Eucalyptus tereticornis* (forest red gum) and *Metrosideros tomentosa* (pohutokawa). These were chosen as having shiny green leaves, waxy grey-green leaves and leaf surfaces covered with a dense mat of fine hairs, respectively. Chaston and Doley (2006) found: '[t]he experimental evidence shows that dust generated by mining activities will only have adverse effects on plant leaves when high dust loads are applied'. Further, Doley (2006) found that the most sensitive plant functions may be altered with dust loads of about 8 g/m^2 for dust with medium diameters of 50 µm from coarse road dusts.

Stage 2 mining, particularly in OC4, will occur closer to Munghorn Gap Nature Reserve and Goulburn River National Park than for Stage 1 alone. Dust deposition from the project and other sources is predicted to increase immediately adjacent to the mine in these conservation areas as

shown in Figures 19 (Year 2), 26 (Year 7), 33 (Year 12), 40 (Year 16) and 46 (Year 24, which does not include contribution from other sources) of EA Appendix 3A.

It is predicted that the northern extension of the Munghorn Gap Nature Reserve will receive the greatest increase in annual average dust deposition with greater than 5 g/m^2/month in Year 12 (EA Appendix 3A Figure 33) and Year 16 (EA Appendix 3A Figure 40). The 5 g/m^2/month contour has been used as being indicative of the 4 g/m^2/month contour. A much smaller area of Goulburn River National Park is predicted to be similarly impacted in Year 7 (EA Appendix 3A Figure 26), Year 12 (EA Appendix 3A Figure 33) and Year 24 (EA Appendix 3A Figure 51).

The DECC recommends undertaking dust deposition monitoring in the Munghorn Gap Nature Reserve (see Section 3.1.6). However, dust deposition monitors should be placed so that they do not have restricted airflows in the vicinity of the sampling inlet, such as sites adjacent to buildings, trees and walls, and should have a minimum clear sky angle of 120° (AS/NZS, 2007). It is therefore proposed to site a dust deposition monitor adjacent to the Munghorn Gap Nature Reserve, but within the project boundary.

3.1.3 Effectiveness of Dust Control

Issues

- The EA does not provide any data to validate the assumption that chemical dust suppressants on trafficked areas will result in an 85% reduction in dust emissions.
- Chemical dust suppressants have not been used widely in NSW. The crusting agents are broken up when driven over and are also soluble in light rain. The application of chemical dust suppressants requires constant application. The EA contains no discussion around the management of these issues in relation to managing increased dust levels in the local area.
- In the draft statement of commitments for Stage 2 works, MCM has committed to 'accept an obligation to purchase (if so requested by **any** affected private landholder under the conditions of the Stage 2 Approval) **any** land at which noise or air quality limits determined in the Stage 2 Approval trigger such an obligation, due to the operation of the MCP' (EA Section 6.6.6, DECC emphasis added).
- The DECC considers that there are a number of additional properties that may be affected by dust should chemical dust suppression not be as effective in practice as in theory and winds predominate from the northeast.

Response

Submissions understandably raise concerns regarding the effectiveness of the proposed dust control measures given that the increase in predicted air quality impacts between Stage 1 alone and the integrated MCP is small (see Section 3.1.2). This small increase is the result of MCM's commitment to implement more stringent dust control measures for both the Stage 1 and Stage 2 projects.

The air quality modelling undertaken for Stage 1 alone assumes application of standard industry dust control measures only. However, the air quality modelling undertaken for the integrated MCP assumes the application of standard and enhanced dust control measures, as described in EA Appendix 3A Table 15.

Enhanced dust control measures that will be applied to the Stage 1 and Stage 2 projects that were not proposed for the Stage 1 project alone (Wells Environmental Services, 2006) are:

- Implementation of a road management system, which will include the use of chemical dust suppressants as required. The Stage 1 assessment assumed dust emissions of 1.0 kg/vehicle kilometres travelled (VKT) of total suspended particulate (TSP) on roads and trafficked areas. This is a 75% reduction of uncontrolled dust emissions of 4.0 kg/VKT (see below). Stage 1 and Stage 2 dust emissions have been reduced to 0.6 kg/VKT on roads and trafficked areas. This is a 85% reduction of uncontrolled dust emissions.
- Use of 240-t capacity haul trucks for the transport of ROM coal from OC1 to the ROM coal hopper as opposed to 170-t capacity haul trucks to reduce the number of haul trips required.

Standard Dust Control Measures

The effectiveness of standard dust control measures has been determined in a number of investigations in Australia and overseas:

- Investigations of mine haul roads in the Hunter Valley measured uncontrolled dust emissions to be approximately 4 kg/VKT (SPCC, 1983). This is slightly more conservative than the National Pollutant Inventory (NPI) Emissions Estimation Technique (EET) Manual for Mining (Environment Australia, 2001) which suggests that 3.88 kg/VKT is used for the equivalent uncontrolled dust emissions.
- Dames and Moore (1988) showed that standard dust controls on Hunter Valley coal mine haul roads resulted in dust emission rates of 1.6 and 1.8 kg of total suspended particulates/VKT (i.e., 55 to 60% of uncontrolled dust emissions of 4 kg/VKT).
- The NPI EET Manual for Mining (Environment Australia, 2001) states that 50% control of emissions can be assumed when level 1 watering of 2 L/m^2/hour is employed and that 75% control can be assumed when level 2 watering of greater than 2 L/m^2/hour is employed. This would result in emissions of 1 kg/VKT (i.e., 75% control of 4 kg/KVT). This level of dust control is widely used for air quality modelling for coal mines in the Hunter Valley.
- A US-based review of dust suppression methods by Batista et al. (2004) found that water is 85% effective in controlling dust in coal mines (Thompson [1990] cited in Batista et al. [2004]) (see Table 3.2).
- Better estimates of the level of dust control can be made using the information published in Chapter 4 of the Air Pollution Engineering Manual (Kinsey and Cowherd, 1992). Kinsey and Cowherd found that 95% control of PM_{10} emissions on roads can be achieved when the moisture level in the road surface is 9%, and that 90% control can be achieved with a moisture level of between 7 and 8%.

These investigations provide a range of values for the effectiveness of water alone to control dust (40 to 95%). However, 75% dust control assumed for Stage 1 appears reasonable based on the findings of Kinsey and Cowherd (1992). This is consistent with the opinion of the Panel of Experts appointed by the Minister for Planning to assess key aspects of the Anvil Hill (Mangoola). The Panel found that the project ‘undertook its own dust impact modelling analysis, based on a haul road dust control efficiency of 75%, which it [the Panel] considered to be a reasonably conservative figure’ (DoP, 2006a).

This suggests that the 85% control assumed in the modelling may be achievable with the use of water alone provided sufficient water and water carts are available.

Enhanced Dust Control Measures

While high levels of dust control (85%) can be achieved with water alone (Kinsey and Cowherd,1992), this can increase the risk of slippery road surfaces, rapid deterioration of road surfaces, excess water use and water runoff. Use of chemical dust suppressants as part of a haul road management system allows high levels of dust control while:

- Binding fines in the road surface and reducing the frequency of water application.
- Reducing the amount of water required for dust suppression.
- Reducing requirements for water carts and graders with associated reduced greenhouse gas emissions.
- Improving road conditions and reducing tyre wear.

Chemical dust suppressants have not been widely used in NSW mines. However, they are currently used at Newcrest's Cadia Hill mine and have been trialled recently at BHP Billiton's Mt Arthur Coal mine (BHP Billiton, 2008). In both cases, they were used to reduce water usage while maintaining previous levels of dust control. At Mt Arthur, the trial was showing positive signs in reducing water consumption (by up to 40%) and providing lasting dust control on road and dump surfaces during both normal and adverse conditions. By the end of the 2006-07 summer, it was decided by Mt Arthur Coal that due to the cost of the dust suppressant and the reduction in dry conditions, the use of the chemical dust suppressant would be scaled back. Due to increased rain in 2008, Mt Arthur Coal decided that suppressants were not required.

A range of chemical dust suppressants are available, salts and brines, non-petroleum based organics, petroleum based organics, synthetic polymers, electrochemical products, clay additives and sealants. There are numerous products within each of these categories. Each of these products varies in its use, dust control effectiveness, durability, reapplication time, application and cost. A summary of a US-based literature review of common dust suppressants undertaken by Batista et al. (2004) is presented in Table 3.2. The type of dust suppressant that will be used by MCM will be determined as part of project detailed design.

Table 3.2 Literature review of dust suppressants

Dust suppressant	Products	Effectiveness
Water	Fresh water Reclaimed water Saline water	85% effective in controlling dust in coal mines (Thompson [1990] cited in Batista et al. [2004]).
Salt and brines	Calcium chloride	55% aggregate retention
	Magnesium chloride	77% aggregate retention
Non-petroleum based organics	Vegetable derivatives Pine oil Molasses Lignosulfonates	Approximately 63% aggregate retention.

Table 3.2 Literature review of dust suppressants (cont'd)

Dust suppressant	Products	Effectiveness
Petroleum-based organics	Oiling (petroleum-based) products Waste oil Non-hazardous crude oil Textile oil Solvents Tars, etc.	50 to 98% aggregate retention.
Synthetic polymers	Polyvinyl acetate Vinyl acrylic	Highly effective at increasing tensile strength of clays up to ten times stronger than normal.
Electrochemical products	Sulphonated oils Enzymes Ammonium chloride	Effective in the presence of specific minerals.
Clay additives	Silica oxide - tetrahedral Alumina hydroxide - octahedra	More effective in dry conditions. Prone to losing tensile strength under wet conditions.
Sealants	Sealing material Paving	95 to 100% effective

Source: Batista et al. (2004).

There are no available scientific studies which quantify the reduction in off-site dust impacts from the use of chemical dust suppressants for NSW mines. There are two main reasons for this. First, because chemical dust suppressants have not been widely used in NSW mines. Second, because there are too many variables at any given site to allow a direct correlation between application of chemical dust suppressants and reduction in off-site dust concentrations to be determined. These variables include those that control dust emissions (climatic and meteorological conditions; road use; road maintenance; water application rates; chemical dust suppressant type and concentrations; and application frequencies) and those that control dust dispersion (wind speed and wind direction). (Further comment by PAEHolmes on dust control modelling assumptions for Moolarben Stages 1 and 2 is included as Appendix 2).

Estimated Dust Emissions versus Estimated Dust Control

While it is convenient to discuss the effectiveness of dust control as a percentage, it is the amount of dust emitted from a source, such as a haul road, that determines the potential for off-site dust impacts. Holmes Air Sciences undertook air quality modelling on the basis that 0.6 kg/VKT of dust will be emitted from haul roads (85% of average uncontrolled dust emissions, which are 4 kg/VKT). Therefore, dust emissions on haul roads must be equal to or less than 0.6 kg/VKT during the worst-case meteorological conditions (i.e., the conditions investigated by air quality modelling) for the air quality modelling to be valid.

Modelled Emissions of PM_{10}

The air quality modelling for the MCP assumes that 40% of the total suspended dust is in the PM_{10} size range (to which the health-based dust criteria apply) while the NPI emission factor equations (Environment Australia, 2001) assume that only 25% of TSP is in the PM_{10} size range. Therefore, the modelling has taken a more conservative approach than recommended in Environment Australia (2001).

Stage 1 and Stage 2 Dust Management

Chemical dust suppressants will be used for the MCP as part of the haul road management system that will include:

- Haul road design.
- The type or types of chemical dust suppressants.
- Chemical dust suppression application methods, rates and frequency.
- Training of mine personnel, including haul truck and water cart drivers.
- Monitoring the effectiveness of chemical dust suppressants, including water cart usage (engine hours), water use, road condition, potential dust generation and off-site dust monitoring (see Section 3.1.6).
- Ongoing review and optimisation of the use of chemical dust suppressants.

Moolarben Coal Mines commits to applying enhanced dust control measures, including the use of chemical dust suppressants. Further, MCM commits to preventing dust criteria from being exceeded at non mine-owned residences except at properties that have Stage 1 acquisition rights (properties 5, 25, 29, 29A and 29B). Based on the air quality modelling results, this will require that no more than 0.6 kg/VKT TSP be emitted during the worst-case meteorological conditions.

The effectiveness of the haul road management system, including the effectiveness of dust control measures, will be reviewed as part of ongoing monitoring as detailed in the environmental management plans. This includes real-time monitoring of off-site air quality (EA Section 5.1.7.2). Real-time PM_{10} trigger values are discussed in Section 3.1.4. Long-term monitoring and continuous improvement are described in EA Section 5.1.7.3.

Moolarben Coal Mines will implement all practical measures to meet their commitment to prevent dust criteria from being exceeded at non mine-owned residences, as described above. However, a non mine-owned property may be impacted by dust from the MCP in unforeseen circumstances (i.e., circumstances outside of the conservative assumptions used in the air quality model), with the annual PM_{10} concentration or the annual TSP dust criteria in EA Table 5.1.1 being exceeded or the short-term criteria in EA Table 5.1.2 being exceeded. If this occurs, the property will be acquired by MCM if a written request from the land owner for acquisition is received (EA Section 5.1.7.4).

3.1.4 Reactive Dust Management

Issues

- The DECC recommends the development of a reactive dust management strategy, including specific trigger levels, be formalised in the recommended conditions of approval. These conditions should include an assessment of the effectiveness of chemical dust suppressants.

Response

Real-time response measures will be described in the Air Quality Management Plan for the MCP. Initially, the real-time response triggers and management measures provided in Table 3.3 will be adopted. The initial trigger values will be updated as understanding of the weather patterns and the behaviour of materials on-site is developed with operational experience.

Table 3.3 Real-time air quality control response measures

Trigger Level	Monitoring Response Trigger	Management / Control Actions
1	Winds emanating from between the NE and SSE vectors; and Preceding 24-hour average PM_{10} at TEOM 1, 2 or 3 reaches 40 µg/m^3.	Review weather data and trends Review weather predictions Review current dust generating activities Review current dust controls Ensure standard mitigation measures are in place Monitor changes in PM_{10}
2	Winds emanating from between the NE and SSE vectors; and Preceding 24-hour average PM_{10} at TEOM 1, 2 or 3 reaches 50 µg/m^3.	Operational changes: e.g., restricting overburden dumping to areas protected from the wind on the lee side of overburden emplacements.
3	Winds emanating from between the NE and SSE vectors; and Preceding 24-hour average PM_{10} at TEOM 1, 2 or 3 reaches 150 µg/m^3.	Reschedule dust generating activities.

3.1.5 Blasting

Issues

- Blasting in certain meteorological conditions can lead to significant off-site dust impacts on residences and the Munghorn Gap Nature Reserve. The DECC recommends that MCM commit to the implementation of a blast dust management protocol that outlines the meteorological conditions during which blasting may only occur, which will ensure that the blast-generated dust is limited.

Response

A blast management plan will be prepared, which will include protocols to ensure that blasting does not occur during meteorological conditions that will result in significant off-site dust (or hazardous emissions) impacts on residences, the Munghorn Gap Nature Reserve or Goulburn River National Park.

Prior to blasting, a blasting exclusion arc will be calculated based on the wind direction, the wind speed, the depth of the blast beneath the natural ground surface and the size of the blast. No blasting will be undertaken if a non mine-owned residence is predicted to fall within the blasting exclusion arc or if significant off-site impacts on Munghorn Gap Nature Reserve or Goulburn River National Park are predicted. The potential impacts of dust deposition, including that from blasting, on native vegetation is discussed in Section 3.1.2.

3.1.6 Monitoring

Issues

- It would be ideal for MCM to analyse wind direction patterns over a longer duration dataset, preferably at least five years to determine if there is a dominant pattern. The use of the 2005 dataset in the modelling may have underestimated potential impacts at residences to the west

and southwest of the site. As such, the DECC recommends that MCP continue to operate WS1 (weather station no. 1) and WS2 (weather station no. 2) in their present locations.

- The DECC recommends that MCM identifies and establishes TEOM 2 in a location representative of the residential areas to the west and southwest of the project area.
- Additional dust deposition monitoring should be undertaken at the Aboriginal rock art shelter located above UG2 (DM10) and in the Munghorn Gap Nature Reserve (DM11).
- An appropriate monitoring network should be established by MCM to allow for the distinction between the MCP and other surrounding operations regarding the source of dust emissions.

Response

Meteorological monitoring will continue at WS1 and WS2.

As discussed in EA Section 5.1.7.2, it is proposed to relocate TEOM 2 from its present location (the mine-owned property 16). It is proposed to locate TEOM 2 at the southern end of property 6 (see EA Plan 16). This location is generally southwest of the project area and will provide real-time data on dust levels directly between the project area and the Winchester Crescent and Ridge Road rural residential area.

The Aboriginal rock art shelter located above UG2 is located near a ridge crest and is surrounded by native vegetation. It would be difficult to find a location to place a dust deposition monitor with minimum clear sky angle of 120° (see Section 3.1.2). Given that dust deposition monitors collect vertically deposited dust, it is unlikely that a monitor adjacent to the rock shelter will provide useful information regarding the potential for dust to impact rock art, which is itself under shelter.

It is proposed to install a dust deposition monitor (not proposed in the EA) within the project boundary adjacent to the Munghorn Gap Nature Reserve (DM11) (see Section 3.1.2).

Real-time monitoring of PM_{10} concentrations using the three TEOM instruments along with meteorological data from the two weather stations will generally allow the source of dust reaching sensitive receptors to be determined. This will particularly be the case when considering dust impacts from the MCP and Ulan coal mine on Ulan village and the Winchester Crescent and Ridge Road rural residential area, which are in different directions from these two mines.

3.1.7 Amendments to Draft Statement of Commitments

Issues

- The DECC proposes the following amendments to the draft statement of commitments regarding air quality:
  - Windblown dust control procedures as outlined in Table 14 on page 42 of the Holmes Air Sciences report of 5 March 2009 (EA Appendix 3A) will be undertaken.
  - Additional TEOM and meteorological stations will be installed as required by the Department.
  - Determination of unfavourable meteorological conditions during which blasting will not occur.

Response

MCM commits to:

- Implementing control measures for windblown dust (EA Appendix 3A Table 14) and mine generated dust (EA Appendix 3A Table 15).
- The relocation of TEOM 2 to a location representative of residential areas to the west/southwest of the mine, as approved by the DECC (see Section 3.1.6).
- The installation of a mobile TEOM (TEOM 3) as described in EA Section 5.1.7.2.
- Ongoing operation of the two meteorological stations (WS1 and WS2).
- Calculation of blast exclusion zones based on meteorological conditions (see Section 3.1.5).

3.1.8 Recommended Special Conditions of Consent

Issues

- The DECC recommends that the following special conditions are applied to the Stage 2 Project Approval:

  1. A dynamic dust management plan must be maintained and developed on an ongoing basis for the site which addresses the following:

  – The minimum aim of the plan must be to achieve and demonstrate best management dust control practice for the mine.

  – Effective reactive management of activities on the mine in response to the results of measured real-time PM_{10} and other inputs (trigger levels). The reactive management strategy must aim to control PM_{10} (and/or other dust) levels due to the mine at receiver locations.

  – Detail of the identification and establishment of a minimum of one TEOM monitor at a location representative of residences to the west and southwest of the project site.

  – Commit to a minimum of one review of the effectiveness of the dust management plan after twelve months.

  – A commitment to updating the plan and the management of all relevant activities on the site in accordance with the findings of any review of the plan.

  – Availability of the plan to the Department upon request.

  – The implementation of all actions specified in the plan must be in the course of routine operation of the site.

  2. An investigation by a suitably qualified person must be undertaken within 3 months of project approval to establish readily identifiable indicators of 85% control of dust by watering of and use of chemical dust suppressants on trafficked areas. A report is to be provided to the DECC upon completion. The indicators identified in the study are to be incorporated in the mine's best practice dust management plan at 1 above.

Response

The haul road management system, which will include the use of chemical dust suppressants, will be developed and implemented based on expert dust management advice. The management system will include a monitoring program to determine its effectiveness for on-site and off-site dust control (see Section 3.1.3). These monitoring results will be used to optimise all aspects of the haul road management system.

It is recommended by the DECC that an investigation of the dust control measures be undertaken within three months of project approval. However, given all of the climatic, meteorological and operational variables that effect dust control (see Section 3.1.3), it is unlikely that the effectiveness of dust control will be determined within such a short period. It is proposed that a review of the effectiveness of dust control measures is undertaken based on the first 12 months of monitoring data. The parameters that provide the best indication of the effectiveness of dust control will be identified as part of this review. This will provide a detailed understanding of dust control measures on-site and will be made available to the DECC as part of the annual environmental report. The review will be used to update the dust management plan that will be implemented on-site.

So while it is not proposed to specifically investigate whether 85% dust control is achieved on the haul roads and to identify indicators after three months, off-site PM_{10} concentrations and dust deposition will be monitored as part of the MCP monitoring program (EA Section 5.1.7). The results of this monitoring will be reported every calendar quarter to the Environment Protection Authority (EPA) in MCM's quarterly report. These results will also be available on MCM's website.

The other special conditions recommended by the DECC are addressed above.

3.1.9 Spontaneous Combustion

Issues

- The EA does not indicate the possibility of spontaneous combustion occurring in the Stage 2 overburden stockpiles. Both Wilpinjong and Ulan coal mines have had this issue and the MCP will be sourcing coal from the same coal seam.
- The suggestion that coal will be left in stockpiles for longer than two weeks is highly optimistic. This would depend on economic circumstances and availability of access to rail and port facilities.
- There is no consideration of spontaneous combustion occurring in overburden emplacements or open cut backfills. These are the areas where Wilpinjong and Ulan coal mines have experienced management problems with spontaneous combustion.

Response

As described in EA Section 5.1.8, coal from the Ulan Seam is susceptible to spontaneous combustion. Where spontaneous combustion occurs, it results in occupational health and safety risks, may result in odours that will impact on neighbouring areas, if uncontrolled, and will reduce economic returns from the project. Mines extracting coal from the Ulan Seam therefore implement spontaneous combustion management plans (SCMP) to prevent these impacts. The last major spontaneous combustion event in the area occurred in the Ulan underground mine 18 years ago in 1991. The Wilpinjong and Ulan coal mines have SCMPs that have been successfully

implemented to prevent major spontaneous combustion events and minimise smaller incidences of spontaneous combustion occurring since this time. The main SCMP control measures are described in EA Section 5.1.8. Overburden emplacements and spoil piles (open cut backfills) will be managed to minimise exposure to atmospheric oxygen. This will be largely achieved through the rapid burial of material that has sufficient carbon containing waste to be susceptible to spontaneous combustion under inert materials (e.g., overburden).

3.2 Greenhouse Gas

3.2.1 Greenhouse Gas Assessment Method

Issues

- Arguments regarding the significance of greenhouse gas emissions from the project are based on a bizarre set of calculations and claim that the effect of a given quantity of greenhouse gases to the atmosphere is less and less as the concentration becomes higher and higher.
- The EA only takes into account the emissions generated by diesel fuel consumption and electricity used on the site. It does not include the emissions produced by the coal that is mined.
- The EA does not provide a quantitative assessment of potential greenhouse gas emissions from spontaneous combustion.
- The Greenhouse Gas Assessment report (EA Appendix 3B) incorrectly calculates the Scope 1 emissions by including spontaneous combustion emissions as Scope 3 emissions.
- The Greenhouse Gas Assessment is presented as a revised assessment of Stage 1, therefore consideration of spontaneous combustion and other Scope 1 emissions for the entire operation have not been accurately assessed.
- There is no consideration in the Scope 1 calculations of the emissions from low-temperature oxidation of waste coal in spoil piles[1].
- The Greenhouse Gas Assessment report (EA Appendix 3B) does not include greenhouse gas emissions sourced from exposed tailings in the calculations.

Response

The greenhouse gas assessment (EA Section 5.2 and Appendix 3B) considers the three scopes of greenhouse gas emissions defined by the Commonwealth Department of Climate Change (DCC) (DCC, 2008a):

- Scope 1 – direct emissions from sources within the boundary of an organisation, such as fuel combustion and manufacturing processes.

[1] Carras, J.N., Day, S.J., Saghafi, A. and Williams, D.J. 2008. Greenhouse gas emissions from low-temperature oxidation and spontaneous combustion at open-cut coal mines in Australia. CSIRO.

- Scope 2 – indirect emissions from the consumption of purchased electricity produced by another organisation. Scope 2 emissions result from the combustion of fuel to generate electricity and do not include emissions associated with the production of fuel.
- Scope 3 – all other indirect emissions that are a consequence of an organisation's activities, but are not from sources owned or controlled by the organisation.

Greenhouse gas emissions for each of these scopes for the integrated (Stage 1 and Stage 2) MCP are presented in EA Table 5.2.1.

The relationship between the addition of greenhouse gases to the atmosphere and climate change is discussed in EA Appendix 3B Section 3. This section includes a footnote that states, '[t]he warming effect of a given quantity of greenhouse gases to the atmosphere is less and less as the concentration become[s] higher and higher.' This is a statement that the relationship between the concentration of a given greenhouse gas in the atmosphere and the effect that it has on global warming is not linear. It does not imply that the addition of a greenhouse gas to the atmosphere results in a decrease in global warming.

Product coal, unrecoverable coal and carbon-containing waste materials (spoil piles, rejects and tailings) have the potential to spontaneously combust. A SCMP will be prepared and implemented to minimise this risk (EA Section 5.1.8).

The MCP will produce thermal coal. This product coal will be burned and will produce greenhouse gas emissions. Off-site combustion of product coal (e.g., in a power station) will result in Scope 3 emissions. Any spontaneous combustion of product coal within the project boundary, either prior to extraction, in raw coal stockpiles or in product coal stockpiles, will result in Scope 1 emissions. This product coal will then not be available for sale and off-site combustion. So while spontaneous combustion of product coal will increase Scope 1 emissions, the product coal burned on-site will not go on to produce Scope 3 emissions. Therefore, the total greenhouse gas emissions (Scope 1, 2 and 3) associated with the extraction and use of the coal will remain unchanged (EA Appendix 3B Section 4.3.2).

It is acknowledged that if any spontaneous combustion of unrecoverable coal and carbon-containing waste materials in situ, in spoil piles or in emplacements occurs, the associated greenhouse gases generated will be Scope 1 emissions. However, it is not possible to estimate the amount, if any, of spontaneous combustion and any resulting greenhouse gas emissions.

As described in EA Section 5.1.8, coal reacts with atmospheric oxygen even at ambient temperatures. This is low-temperature oxidation and if the resulting heat accumulates, spontaneous combustion may occur. Some low-temperature oxidation of waste coal in spoil piles or tailings may occur, however, the contribution to greenhouse gas emissions from this source will be small. As Carras et al. (2009) report:

> A key finding of the research is that the emission rates of greenhouse gases from spoil piles where there is no spontaneous combustion, but only low-temperature oxidation of coal and coal waste, are similar to the emission rates due to biological activity from vegetated surfaces.

Carras et. al. (2009) go on to report '[e]missions from spoil were generally similar to those from reject and tailings'.

Tailings and coarse rejects waste from the washing of coal will not be left in spoil piles, but rather buried with waste rock in the open pits. The burying of coal benefication wastes and co-disposal with non-reactive rock will reduce the potential for these waste coal materials to oxidise and generate greenhouse gas emissions.

3.2.2 Greenhouse Gas Emissions and Climate Change

Issues

- The use of the coal for electrical power generation produces carbon dioxide, a greenhouse gas, and therefore contributes to climate change. Specifically, the expanded mine will produce 700 or 800 million tonnes (Mt) of CO_2-e, which is 1.5 times Australia's net yearly emissions.
- The projected contribution of the MCP to rising global temperatures is very significant, especially given that this, after all, is but one coal mining project in Australia.
- It is refuted that the MCP's contribution to greenhouse gas emissions will be statistically insignificant.
- Greenhouse emissions violate NSW Government's Ecologically Sustainable Development (ESD) Principles as the impacts of burning coal are potentially irreversible and pose substantial intergenerational environmental stress.

Response

The average annual greenhouse gas emissions from the integrated MCP site (Scope 1 and 2 emissions) and from production and use of the coal (Scope 1, 2 and 3 emissions) are provided in EA Section 5.2.4 and are summarised in Table 3.4.

Table 3.4 Average annual greenhouse gas emissions for the integrated MCP

Scopes 1 and 2				Scopes 1, 2 and 3			
Greenhouse Gas Emissions (Mt CO_2-e)	Contribution to Total Emissions			Greenhouse Gas Emissions (Mt CO_2-e)	Contribution to Total Emissions		
	NSW	Australia	Global		NSW	Australia	Global
0.262	0.16%	0.046%	0.00054%	29.585	18.49%	5.14%	0.060%

The indirect greenhouse gas emissions from transportation and burning of the coal (Scope 3 emissions) will be, by far, the greatest contributor (99.1%) to emissions associated with the project.

The contribution of Scope 1 and 2 emissions from the integrated MCP and Scope 1, 2 and 3 emissions to total anthropogenic greenhouse gas emissions from NSW, Australia and globally are provided in Table 3.4. These calculations are based on the following total emission values:

- NSW's annual greenhouse gas emissions in 2006 (DCC, 2008b): 160 Mt CO_2-e.
- Australia's annual greenhouse gas emissions in 2006 (DCC, 2008b): 576 Mt CO_2-e.

- Global annual greenhouse gas emissions in 2004 (IPCC, 2007)[2]: 49,000 Mt CO_2-e[3].

Most of the coal from the project will be exported with CO_2 emissions from the use of the coal being realised from a number of countries. The annual Scope 1, 2 and 3 emissions from the extraction and use of the coal from the MCP are therefore best compared to global greenhouse gas emissions, i.e., total greenhouse gas emissions from coal associated with the project will be 0.060% of total global emissions.

Various submissions compare the total Scope 1, 2 and 3 emissions for the 24-year life of the mine (710 Mt CO_2-e) to the annual Australian greenhouse gas emissions (576 Mt CO_2-e/year), and conclude that the mine contributes 1.5 times Australia's net yearly emissions. This is technically correct. However, it compares emissions over very different time scales (24 years compared to 1 year) and on different geographical scales – global emissions resulting from use of MCP coal outside of Australia compared to Australian emissions.

The MCP will be just one of many coal mines around the world. The contribution of the MCP to black coal (also known as hard coal) production in NSW, Australia and globally is summarised in Table 3.5 based on a maximum MCP coal production of 13 Mt/year.

Table 3.5 Comparative contribution of MCP to NSW, Australian and global hard coal production

Coal production (Mt)			Comparative contribution of MCP coal production		
NSW[#] (2007-08)	Australia[#] (2007-08)	Global[†] (2006)	NSW[#] (2007-08)	Australia[#] (2007-08)	Global[†] (2006)
135	323	5,205	9.6%	4.0%	0.2%

[#] ABARE, 2009.
[†] World Coal Institute, 2008.

Production of coal is driven by global demand. The global demand for coal will not be changed by the development (or non-development) of the project. It is therefore expected that global greenhouse gas emissions from the use of thermal coal will be the same whether or not the project is developed.

In comparative terms, the MCP will make a small contribution to global greenhouse gas emissions. However, MCM accepts that it is not in a position to determine whether these contributions are negligible or significant, as this is dependent on the criteria used to define significance for each stakeholder. Further, development of coal mines have not been found by the NSW Government to be in violation of ESD Principles.

As stated in EA Section 5.2.5, the Stage 1 Energy Savings Action Plan will be updated and applied to Stage 2. Under its Stage 1 Project Approval, MCM is also required to implement

[2] This underlying report, adopted section by section at the Intergovernmental Panel on Climate Change (IPCC) Plenary XXVII (Valencia, Spain, 12-17 November 2007), represents the formally agreed statement of the IPCC concerning key findings and uncertainties contained in the Working Group contributions to the Fourth Assessment Report.

[3] Section 3 of EA Appendix 3B reports that 'The IPCC (IPCC, 2001) estimated that in the 1990s emissions of CO_2 from burning fossil fuels and the production of cement, was 6.3 Gt of carbon per year or 23 Gt of CO_2 per year.' It is more useful to compare Scope 1, 2 and 3 emissions to the global CO_2 equivalent for the most recent available year, i.e., 2004.

measures to minimise the greenhouse gas emissions from underground mining operations. It is expected that MCM will be required to implement greenhouse gas emission minimisation measures for the Stage 2 underground operations.

The statement of commitments (EA Section 6) includes a range of management measures to reduce greenhouse gas emissions.

3.2.3 Impacts of Climate Change on the Local Environment

Issues

- As a result of climate change, to which the project is contributing, there will be increased bushfire risk; Ridge Road was identified by the NSW Rural Fire Service as the most vulnerable high casualty area in the State.
- The recently released DECC report on climate change in the Upper Hunter predicts a significant decrease in rainfall and runoff. The impact of this decrease will begin to be felt during the life of this mining proposal. There is no indication that the models used to predict water impacts have taken this decrease into account.

Response

The predicted impacts of climate change in the Hunter-Central Rivers Catchment, in which the MCP is located, are summarised in CSIRO (2007). These predictions are based on predictions for NSW by Hennesy et al. (2004a, 2004b).

It is predicted that by the year 2030 (CSIRO, 2007):

- NSW is likely to become warmer than it was in 1990.
- There will be more hot days over 35°C and fewer frost days below 0°C.
- Annual rainfall is likely to decline.
- Rainfall runoff and stream flows will be reduced.
- Droughts are likely to become more severe.
- The risk of bushfires is likely to increase.
- Extreme rainfall may become more intense in central and southeast NSW.

CSIRO (2007) summarises the local impacts as follows:

> The future climate of the Hunter-Central Rivers Catchment is likely to be warmer (Figure 2) [see CSIRO (2007) for a copy of this figure]. Although projected changes in average rainfall are currently not clear, given projected increases in evaporation, the catchment is likely to be drier. Such climate changes would also increase heat waves, extreme winds and fire risk. Nevertheless, despite this trend toward drier conditions, there is also potential for seasonal increases in extreme rainfall events.

The projected temperature change for the Hunter-Central Rivers Catchment is an increase of between 0.2 and 1.6°C by 2030 and an increase of between 0.7 and 4.8°C by 2070. The predicted average annual rainfall varies between a 7% decrease and a 7% increase by 2030 and between a 20% decrease and a 20% increase by 2070.

Climate change impacts are the result of cumulative global greenhouse gas emissions. The range of predicted temperature and rainfall variations is an indication of the difficulty of predicting the changes based on global emissions. It is not yet possible to accurately predict climate change

impacts from the comparatively small emissions produced by individual projects. However, an estimate of the impact of the MCP on global temperature change was made in EA Appendix 3B:

- It is estimated that Scope 1 and 2 emissions from the integrated MCP (average 0.26 Mt CO_2-e/year) will contribute 0.000000238°C/year or 0.0000057°C over the life of the mine to a global 2.5°C temperature increase resulting from a doubling of atmospheric CO_2 concentrations (EA Section 5.2.4.4).
- It is estimated that Scope 1, 2 and 3 emissions associated with coal from the MCP (average 29.6 Mt CO_2-e/year) will contribute 0.000027°C/year or 0.00065°C over the life of the mine to a global 2.5°C temperature increase resulting from a doubling of atmospheric CO_2 concentrations (EA Section 5.2.4.4).

In isolation, the MCP will have very little effect on global atmospheric temperature and climate change. However, global fossil fuel use is likely to have a significant impact on global atmospheric temperature and climate change. The greenhouse gas emissions from the extraction of fossil fuels are small compared to the emissions from the use of these fuels.

As the contribution of the project to increased global temperature will be extremely small, its contribution to bush fire risk to Ridge Road will also be extremely small.

3.2.4 Penalties for Climate Change Impacts

Issues

- The government and/or community should retain the right to revoke the approval to mine this publicly-owned coal resource (with no compensation), if, within a reasonable time (5 to 10 years), the coal is not being used in an ecologically sustainable carbon capture and storage system.
- The public, who must bear the consequences of this approval, should retain the right to seek action for damages (relating to greenhouse gases).

Response

The right to revoke a project approval, based on whether carbon capture and storage is applied, or the right to seek action for damages (relating to greenhouse gases) is not part of government policy and would not be supported by MCM.

3.3 Blasting

3.3.1 Cumulative Blasting Impacts

Issues

- Blasting will occur up to six times a day (and up to 23 blasts per week) from Wilpinjong coal mine and Stages 1 and 2 of the MCP.
- There is an increased potential for further disturbance from blasting on the local community, flora and fauna.

- There will be an increased risk to the structural integrity of local residences, buildings and sensitive natural features (such as the sandstone overhangs). Households are experiencing blasting damage in excess of 2 km from the Wilpinjong coal mine.
- The impact of noise exceedances on the Munghorn Gap Nature Reserve and potential mitigation measures have not been adequately addressed and the proposed 20 m buffer between the mine and the reserve for OC4 is highly inadequate.
- There will be an increase in the quantity of toxic gases released into the atmosphere, which will impact on both human and animal health.

Response

The blasting regime that MCM anticipates will be required for the MCP is described in the EA as follows:

> Blasting will generally be conducted between the hours of 9.00 a.m. to 5.00 p.m. Monday to Saturday with up to 2 blasts per day and 9 blasts per week averaged over any 12 month period.

This is the same blasting regime that was approved for Stage 1. Moolarben Coal Mine will not increase the frequency of required blasting across the whole MCP (Stages 1 and 2 combined) beyond that already approved for Stage 1. Rather, blasting will be coordinated between Stages 1 and 2, so that the total number of blasts across the MCP remains within the frequency limits set by the Stage 1 Project Approval.

In addition, MCM reiterates its Stage 1 commitment to coordinate blasting between the MCP and the adjoining Wilpinjong and Ulan coal mines. This will avoid the potential for simultaneous blasting between the mines and thereby minimise the disturbance from blasting on the surrounding community.

The closest non mine-owned residence to OC4 is property 5 (see EA Plans 2 and 2A), which is located 2 km to the west of the nearest point of OC4. The next closest residences are properties 20, 25, 29, 29A, 29B and 36 all of which are located more than 3 km from OC4. Each of these properties has acquisition rights under the Stage 1 Project Approval, so their owners can ask the company to acquire their property at any time.

An assessment of the blasting impacts for Stage 2 on non mine-owned properties determined that vibration and overpressure levels at all non mine-owned residences will be below the ANZECC blast guideline criteria of 10 mm/s for vibration and 120 dB for overpressure (ANZECC, 1990) (EA Appendix 4). The intent of these criteria is to minimise annoyance and discomfort to persons at noise-sensitive sites. Meeting the human annoyance criterion for vibration at non mine-owned residences will also ensure there will be no blast-induced structural damage to these properties.

The blast assessment also predicted that the maximum level of ground vibration from blasting in OC4 at the Aboriginal rock art site above UG2 will be 34 mm/s. This vibration level is below the 40 mm/s conservative criterion set in the Stage 1 Project Approval to protect this same feature. However, MCM will continue to monitor ground vibration at this art site and carry out visual inspections of the integrity of the rock outcrop whenever blasting is conducted within 1,000 m of the site.

Blasting in OC4 will also occur in close proximity to the Munghorn Gap Nature Reserve. This will not impact on visitors to the reserve, as readily accessible places within the reserve are well over

2 km from OC4 and are generally shielded by topography. At this distance, overpressure levels will be less than the 120 dB ANZECC criterion.

There are no guidelines or established criterion that provides guidance to the level of overpressure to which fauna would experience annoyance or harm, and it is expected that blasting could impact some fauna species that inhabit areas in close proximity to OC4. However, most fauna species encountered in the area are highly mobile and would therefore be expected to temporarily migrate away from the immediate area of blasting within their rangeland habitat. Further, blasting will not be a continuous activity and the size of blasts will vary according to rock conditions. Hence, not all blasts will generate the same level of overpressure.

A blast management plan will be prepared which will include protocols for assessing meteorological conditions (see Section 3.1.5). Blasting will not occur during meteorological conditions that will result in significant off-site dust (or hazardous emissions) impacts on residences, the Munghorn Gap Nature Reserve or Goulburn River National Park. This plan will be integrated with the Stage 1 blast management plan so that blasting across the entire MCP is carried out in a coordinated and integrated manner.

3.3.2 Ground Vibration and Overpressure Monitoring

Issues

- The DECC considers that ground vibration and overpressure monitoring should be undertaken at the nearest non mine-owned residence (not the subject of a private agreement) and noise sensitive location, and when blasting is within 1 km of the Aboriginal rock art site above UG2.
- The DECC recommends that MCM commit to:
  - Limiting the maximum instantaneous charge (MIC) of blasts to 1,788 kg.
  - Limiting blasts, where the MIC exceeds 400 kg, to one blast per week when averaged over a 12-month period.

Response

Moolarben Coal Mines acknowledges the DECC's consideration for monitoring of ground vibration and overpressure at the nearest non mine-owned residence and sensitive locations to Stage 2 blasting. However, with the exception of properties that have acquisition rights under the Stage 1 Project Approval, all non mine-owned residences are located at a distance of greater than 4 km from OC4.

The blast impact assessment (EA Appendix 4) modelled ground vibration and overpressure effects for a MIC blast of 1,788 kg at a residence (now owned by MCM) located 1,975 m from proposed blasting in OC4. At this distance ground, vibration and overpressure were predicted to be below the ANZECC guideline criteria. Therefore, it is expected that ground vibration and overpressure at all non mine-owned residences, not the subject of Stage 1 acquisition rights, will be well below the ANZECC criteria.

Moolarben Coal Mines will monitor ground vibration and overpressure when blasting is within 2 km of non mine-owned properties with acquisition rights under the Stage 1 Project Approval.

As indicated in Section 3.3.1, MCM will monitor ground vibration at the rock art site above UG2

whenever blasting is within 1,000 m of the site.

Moolarben Coal Mines commits to limiting the MIC of blasts to 1,788 kg. Further, MCM commits to limiting the frequency of blasting across the MCP (Stages 1 and 2) to that specified within the Stage 1 Project Approval.

3.4 Aboriginal Heritage

3.4.1 Destruction of Aboriginal Cultural Heritage

Issues

- Five high-significance and 16 medium-significance Aboriginal heritage sites should not be removed and two high-significance and seven medium-significance Aboriginal heritage sites should not be disturbed.

Response

The Aboriginal cultural heritage assessment conducted by Archaeological Risk Assessment Services Pty Ltd (ARAS) found that the majority of Aboriginal sites recorded within the study area were not unique or rare, but commonly represented in the surrounding landscape (EA Appendix 9 Section 11.4). Further, Aboriginal sites and objects are often lost from their local setting due to residential, industrial, agriculture, mining, infrastructure (i.e., road, rail, power, etc.) and other developments.

'Scientific Significance' ratings were assigned by ARAS to the Aboriginal sites found in the Stage 2 study area. This is not the same as cultural significance. The five sites of high-significance that will be removed were determined to have this level of significance due to their archaeological, scientific and regional research potential.

All of the sites that will be permanently removed are artefacts, artefact scatters, or potential archaeological deposits (PADs). No open campsites, scarred trees, grinding grooves, art sites, burial sites, or other culturally significant sites will be knowingly disturbed by Stage 2 activities (EA Appendix 9 Table 9). Disturbance and removal of sites, artefacts and PADs will be carried out according to specific protocols and in conjunction with Aboriginal community groups. Moolarben Coal Mines has committed to the collection and recording of surface finds, the excavation and salvage of a number of sites and intensive surface recording including fine scale mapping and photography of sites that will remain in the project area. It has also committed to the specific conservation of some of the more important cultural heritage landscape areas and sites within the Stage 2 Project Area.

The Aboriginal Heritage Plan for Stage 1 was developed in consultation with local Aboriginal community groups and the DECC. This will be updated and extended to encompass Stage 2 with input from local Aboriginal representatives, the DECC and qualified experts. The plan will be implemented across the whole of the MCP to ensure Aboriginal heritage is preserved and/or recorded, as appropriate.

Site recordings and salvaged artefacts will be stored off-site in a local Keeping Place, which has been provided by MCM to the local Aboriginal community. It is expected that this Keeping Place will be open to all interested Aboriginal people and relevant scientific researchers.

3.4.2 Subsidence Impacts

Issues

- The 55 m buffer distance proposed to protect the Aboriginal artworks in Cliff C7 from subsidence is inadequate.

Response

Moolarben Coal Mines has committed to designing and operating its underground mines (UG1 and UG2) to protect the integrity of any significant Aboriginal rock art in the area of surface subsidence above UG1 and UG2 (EA Section 6 Commitment 13). Cliff C7 above UG2 contains a rock overhang with Aboriginal art (archaeological site S2MC 236 / DECC site 36-3-0134). This rock overhang also contains non-Aboriginal graffiti, some of which disfigures the Aboriginal art.

The overhang containing the rock art is situated directly above proposed longwalls LW12B and LW13. This rock overhang will be protected from the impacts of underground mining by retaining a block of coal directly beneath the rock outcrop, between the two longwalls (EA Section 5.8.5.2 and EA Appendix 8). Retaining a block of coal through partial extraction of longwalls is a standard practice employed at other coal mines in NSW to protect sensitive surface features. Mine Subsidence Engineering Consultants (experts in mine subsidence with extensive experience in the coalfields of NSW) has determined that a barrier width equal to 0.5 times the depth of cover at the edge of the nearest panel is adequate to protect a natural surface feature from the effects of mine subsidence. In this case, the depth of cover at the edge of the nearest panel to the rock outcrop containing the art is 110 m. Hence, a 55 m barrier around the rock outcrop is considered adequate to inhibit subsidence-induced cliff instabilities.

Prior to commencing longwall mining, MCM will be required to prepare a detailed subsidence management plan for approval by an inter-agency subsidence management committee. This plan will further detail the monitoring, management and mitigation measures that MCM will implement to ensure that the impacts of underground mining are acceptable, including protecting the rock art site.

3.4.3 Sites in Goulburn River National Park and Munghorn Gap Nature Reserve

Issues

- Connections with important Aboriginal heritage sites within the Goulburn River National Park and Munghorn Gap Nature Reserve have not been identified in the EA.

Response

The Aboriginal cultural heritage assessment for Stage 2 (EA Appendix 9) reviewed the outcomes of available past Aboriginal heritage studies carried out in the area. This review determined that prior studies had a site-specific impact assessment focus and that there is no study that specifically considers the significance of Aboriginal cultural heritage in a broader regional context. The review also recognised the importance of the surrounding conservation network in protecting and contributing to an understanding of Aboriginal cultural heritage and its local and regional significance.

As a result, ARAS recommended that a baseline research study be undertaken to assess the regional heritage significance of Aboriginal heritage resources in the Goulburn River National Park. Further, that this study should be funded by government, local mining and agricultural companies (where applicable) and run jointly with the local Aboriginal community. Such a study would enable a better assessment of cultural and scientific significance of Aboriginal sites across the region and remove pressure from dealing with a site by site impact assessment approach.

This recommendation was not carried forward into the EA or Statement of Commitments. However, MCM would support such a study initiated by the government.

3.4.4 Conservation Areas

Issues

- The extent and variety of evidence of Aboriginal connection to the Stage 2 Project Area indicates its importance as a repository of cultural heritage and that important linkages need to be better understood and should not be destroyed.
- Heritage conservation areas should be provided to offset the loss of Aboriginal heritage sites in the Murragamba Creek valley.
- An agreement should be made to protect the conservation areas in perpetuity.
- Adequate mapping is required to determine where the proposed conservation areas are and to determine whether the proposed conservation areas are the same as those proposed as offset areas for Stage 1.

Response

Moolarben Coal Mines recognises that certain landscapes within the Stage 2 footprint comprise important repositories of Aboriginal heritage and that representative sites within the landscape should be conserved. It has therefore committed to preserving 85 Aboriginal heritage sites in four specific conservation areas (EA Section 5.9.6.6). These sites will be conserved in recognition of the importance of preserving representative significant cultural heritage sites in their own right. In addition, any Aboriginal site on MCM-owned land outside the mine disturbance footprint will also be preserved. As previously indicated and as described in the EA, sites that will be disturbed within the mine footprint will be recorded, salvaged and stored in the Keeping Place provided by MCM (see Section 3.4.1).

A plan of the specific Aboriginal heritage conservation areas will be provided in the Preferred Project report for Stage 2, which will be submitted to the DoP following finalisation of all responses to submissions. The cultural heritage landscapes that will be conserved will comprise:

- A section of the riparian corridor along Wilpinjong Creek within the Stage 2 project boundary.
- Identified culturally significant parts of Murragamba Creek and Eastern Creek valleys, predominantly associated with the creeks.
- Cliff line 7 above UG2, which contains a rock art site and other Aboriginal artefacts.

During mining, these conservation areas will be fenced off and erosion control works undertaken, where necessary, to protect heritage sites from further disturbance. Access to the conservation areas will be provided to the Aboriginal community for the long term management of the sites.

Access, monitoring and management protocols for the conservation areas will be included in the Aboriginal Heritage Plan.

Following mine closure, MCM envisages that the conservation areas will be protected in perpetuity through the application of specific land conservation covenants or via dedication to the adjoining National Estate (i.e., Munghorn Gap Nature Reserve and Goulburn River National Park), if acceptable to the DECC. Alternatively, ongoing protection would be expected to be provided by the relevant legislation in place at that time.

3.4.5 Cumulative Impact on Aboriginal Cultural Heritage

Issues

- The cumulative impacts on Aboriginal cultural heritage in the region have not been assessed.
- The cumulative impact is not clearly aggregated or identified as a total loss in the Aboriginal cultural heritage assessment.
- The conclusions of the cumulative impact assessment are not identified in the management measures or statement of commitments.

Response

A cumulative impact assessment is included in the Aboriginal cultural heritage assessment for Stage 2 (EA Appendix 9). However, this assessment is limited to the availability of cultural heritage information provided in other studies undertaken in the region (see Section 3.4.3). Known items of cultural heritage have been identified through site-specific impact assessment studies for mines and other developments in the area. Hence, the aggregated or total loss of cultural heritage from the landscape that will result from Stage 2 has not been assessed, as the total cultural heritage of the region is unknown.

3.4.6 Aboriginal Community Input to Archaeological Report

Issues

- The DECC acknowledges that consultation with the Aboriginal community has been undertaken. However, it believes there have been no attempts to properly list the concerns raised, discuss the merits of these and provide a response. It further believes that as part of the consultation process, the Aboriginal community was not provided an opportunity to review and provide comment on the Aboriginal cultural heritage assessment report and, as such, the recommendations of the report may not concur with the wishes of the Aboriginal community.

Response

Moolarben Coal Mines acknowledges that it is Aboriginal people who should determine the cultural significance of Aboriginal heritage. The Aboriginal community was provided several opportunities to review and provide comment on the Aboriginal cultural heritage assessment report (EA Section 5.9.2.1 and EA Appendix 9 (Sections 3, 13.1, 16.3 and Appendix 4)). The draft report was provided to each Aboriginal stakeholder community group for comment. These groups were again given the opportunity to provide written comment on the final report's recommendations. This review process involved site tours to review the report and site management recommendations. The tour also included Aboriginal community members who were not involved directly with the Aboriginal cultural heritage assessment process. Attendants

were encouraged to provide direct feedback (either during the day or by written letter following the tour). At each of these review stages, the concerns of the Aboriginal community were duly noted, and their recommendations incorporated into the final report recommendations.

Moolarben Coal Mines has sought, and will continue to provide, opportunities to involve the Aboriginal community in all aspects of cultural heritage management at the mine. Moolarben Coal Mines has advertised and expects to employ an Aboriginal person in the position of Native Title Cultural Heritage Officer. It has also provided a local Keeping Place to the Aboriginal community to record, store and research Aboriginal cultural heritage objects recovered from across the MCP. It has held a planning workshop with participation from the local Aboriginal community, the DECC and others to develop an Aboriginal Heritage Plan for Stage 1. A similar planning workshop is proposed for Stage 2. As part of this plan, MCM will continue to involve the Aboriginal community in the management of Aboriginal cultural heritage issues identified throughout the life of the project.

3.5 Non-Aboriginal Heritage

3.5.1 Brett Whitely Mural

Issues

- The Brett Whitely mural is of cultural significance and should be protected from the impacts of mining.

Response

The Brett Whitely mural is located in a cave near The Drip on the Goulburn River. This feature is over 6 km from the closest element of the Stage 2 project, and about 6.5 km from the closest part of UG1. No aspect of Stage 2 will have an impact on this art work.

In addition, the Minister's approval for Stage 1, granted in September 2007, provides protection to the cliffs along the Goulburn River from mining in UG4 and, hence, protection to the Brett Whitely mural.

3.6 Transport

3.6.1 Stage 2 Road Traffic Movements

Issues

- Road usage and proposed traffic movements associated with Stage 2 need to be clarified.
- Mid-Western Regional Council raised concern that the proposal will generate traffic movements, which would equate to 800 additional movements created by Stages 1 and 2 of the MCP and the Wilpinjong coal mine.
- The road traffic assessment does not appear to consider traffic generated from Ulan Coal Mine Limited's (UCML) existing and currently approved operations.
- The RTA states that traffic volumes and road crash data should be collected and assessed every two years throughout construction and operation of the project to ensure road safety and

traffic measures are operating as intended and that no other major changes in the area have affected safe and efficient traffic operation.

Response

The transport impact assessment (EA Section 5.12.5 and EA Appendix 12) uses baseline traffic flows that include:

- Existing traffic volume based on 2005 Roads and Traffic Authority (RTA) average annual daily traffic (AADT) baseline data. Since UCML mining operations are well-established, traffic associated with the mine is incorporated into existing traffic volumes.
- Traffic volumes from Wilpinjong coal mine based on Wilpinjong Coal Project Environmental Impact Statement, Appendix K, Road Transport Assessment (Traffix, 2005).
- Traffic volumes from Stage 1 of the MCP based on the Moolarben Stage 1 Environmental Assessment Report (Wells Environmental Services, 2006), Appendix 15, Traffic Impact, Road Safety and Railway Level Crossing Assessment.

The additional construction traffic movements from Stage 2 alone are described in EA Section 5.12.5.2. The additional operations traffic movements from Stage 2 alone are described in EA Section 5.12.5.3. Total operational traffic movements (Wilpinjong coal mine, other road users, Stage 1 and Stage 2) are summarised in EA Table 5.12.4.

The carrying capacity of local roads has undergone consideration in the EA report, both by Mid-Western Regional Council (MWRC) and the RTA. The impact on road capacity of Castlereagh Highway (SH18), Ulan-Cassilis Road (MR214) and Cope Road (MR598) is described in EA Appendix 12 Section 4.1.

The 2019 forecast peak traffic volume for each road lies well within its theoretical capacity. In 2019, when both the MCP and Wilpinjong coal mine are expected to be operating under peak production (i.e., the worst-case traffic generation scenario), peak hour traffic movements on Ulan-Cassilis Road and Cope Road are predicted to be well within RTA's carrying capacity for roads of this type.

Moolarben Coal Mines supports the ongoing collection of traffic volumes and road crash data by the appropriate authorities.

3.6.2 Road Traffic Movements during Construction

Issues

- While the EA outlined the extension of the construction period from two to six years, it did not outline how this might affect traffic.

Response

Construction of Stage 2 infrastructure will coincide with the construction of Stage 1 infrastructure and will be completed within the time frame envisaged for Stage 1. That is within 18 months from February 2009. Hence construction traffic for Stage 2 infrastructure will be accommodated within the construction traffic requirements approved for Stage 1, and no additional construction traffic will be required to that already approved for Stage 1.

The reference to a six year construction period (EA Section 4) anticipated minor construction activities occurring at some stage within the first six years of the project following completion of the main infrastructure components, rather than construction occurring over a continuous six year period. For example, a small office, bathhouse and workshop facility will be constructed adjacent to the UG1 entry, prior to commencement of underground mining in year 5. However, such construction activities will be temporary in nature and will not cause a significant increase in traffic on the Ulan-Cassilis Road beyond that from general weekly site deliveries.

3.6.3 Road Maintenance, Safety and Upgrades

Issues

- There is the potential for increased traffic on local roads (e.g., Cassilis-Ulan Road), leading to unsafe driving and overtaking. Contrary to what the EA says, Ulan Road is not capable of coping with an increased traffic flow of cars and heavy and wide load vehicles.
- Mid-Western Regional Council raised concern with the estimated increase in traffic load associated with Stages 1 and 2 and Wilpinjong coal mine, resulting in an additional 3.9 crashes per year.
- Mid-Western Regional Council requested that MCM make additional contributions specific to road upgrades of $200,000 for the intersection of Ulan Road and Wollar Road and $150,000 for the intersection of Ulan Road and Mud Hut Creek Road.

Response

Ulan-Cassilis Road (MR214) and Cope Road (MR598) are classified as regional roads as they perform an intermediate function between the main arterial network of RTA-controlled State roads and the network of local access and circulation roads controlled by MWRC (RTA, 2008). It is the responsibility of MWRC to fund, determine priorities and carry out works on these regional roads. In recognition of their relative importance, some regional roads are eligible for funding assistance from the RTA.

The regional road ‘Block’ grant for the MWRC, received from the RTA for 2008/2009, was $2,248,000. This was the fourth highest grant contribution received from the RTA by any local government in NSW (RTA, 2008). The RTA maintains a statutory interest in all classified roads, and requires input into the design of any proposed works on a classified road, as well as a concurrence role to any proposed works. Mid-Western Regional Council has plans to progressively upgrade several regional roads local to the MCP (e.g., Ulan-Cassilis Road (MR214) between Mudgee and Ulan, and Cope Road (MR598), using funds contributed by MCM (EA Appendix 12 Section 4.3).

Moolarben Coal Mines is committed to working with MWRC and with Wilpinjong and Ulan coal mines to improve road safety and traffic management on the local road network as described in EA Section 5.12.6.

Moolarben Coal Mine is currently finalising the terms of the voluntary planning agreement (VPA) for Stage 2 with MWRC (EA Section 5.14.16). The company has proposed an increase in contributions for MWRC up to a total value of $1,365,000 for Stage 2. Moolarben Coal Mine expects that MWRC will use this money to finance a number of works including road maintenance throughout the local government area (LGA). The Stage 2 financial contribution will be in addition

to the $4,550,000 already contributed by MCM as part of the Stage 1 VPA. Of the Stage 1 contribution, $2,250,000 was allocated for road maintenance (DoP, 2007). Moolarben Coal Mine's contributions for both Stages 1 and 2 will be complemented by VPA contributions from Wilpinjong coal mine who have committed $30,000 per year until mining ceases at their site (DoP, 2006b). Additional grants from the RTA will also provide funding for road construction and maintenance throughout the LGA, as discussed above. Ulan Coal Mine Limited also currently has an application for expansion and it is expected that there will be further contributions to MWRC for road maintenance as a result of this. Some of the funds provided by MCM as part of the VPA will be directed towards the staged upgrade of Ulan-Cassilis Road (MR214) and Ulan-Wollar Road (MR208) in accordance with Schedule 3, Condition 56 of the Stage 1 Project Approval.

In the assessment of road safety (EA Appendix 12 Section 4.3), SKM found that '[w]ith no changes to the road environment, an additional 3.9 crashes per year would be expected [along the Ulan-Cassilis Road].' However, this sections goes on to find:

> The road safety improvements being partly funded by the Moolarben Coal Project and constructed by Council will address, amongst others, the key issues of delineation and pavement condition, which will greatly improve the safety of these roads for all road users. It is expected that the crash rates on these roads will decrease as a result of improvements to the road environment.

The Stage 2 VPA is currently being negotiated and it has not been determined whether or not it will include specific contributions to the upgrade of the intersection of Ulan Road and Wollar Road or the intersection of the Ulan Road and Mud Hut Creek Road. Moolarben Coal Mines expect that VPA contributions will be used by MWRC to upgrade these intersections if they are determined to be a priority within the LGA.

3.6.4 Rail

Issues

- There is a potential for the cumulative increase of trains movements and coal handling on the Gulgong-Sandy Hollow rail line to impact on the community from Ulan to Newcastle.
- There will be an increase in noise levels from coal trains travelling through Mudgee and Gulgong to Lithgow.

Response

The Stage 1 assessment predicted four trains movements per day on average. Stage 2 of the MCP would increase the annual product coal from the currently approved level of 10 million tonnes per annum (Mtpa) to 13 Mtpa. This will require one additional train per day (two train movements) on average comprising three or four locomotives and approximately 91 wagons. This will result in a corresponding increase in noise levels along the Gulgong-Sandy Hollow rail line between the site and the Port of Newcastle, via Muswellbrook (EA Section 5.3.5.7). There will be 30 daily train movements on the Ulan to Muswellbrook route as a result of existing operations and Stage 1 (EA Section 5.12.5.8). Therefore, Stage 2 will result in a 7% increase in train movements along this route and a small percentage of the larger total number of train movements between Muswellbrook and Newcastle.

Once trains leave the Stage 1 rail loop and pass onto the Gulgong-Sandy Hollow rail line, they will be subject to conditions of Australian Rail Track Corporation's (ARTC) environment protection licence (EPL 3124).

Schedule 3, Condition 59 of the Stage 1 Project Approval states that MCM will not transport any coal west of the site through Mudgee and Gulgong without the written approval of the Director-General. This railway line, however, is currently not in a state that is able to accommodate the proposed coal train traffic.

The rail traffic assessment concluded that the only alternative to rail is road transport. Moolarben Coal Mines has rejected this alternative on the basis of environmental, economic, social and road safety considerations.

3.7 Visual Amenity and Landscape

3.7.1 Loss of Aesthetic Value

Issues

- Stage 2 will cause the loss of aesthetic value of the local environment, landscape and catchment (including the Goulburn River).

Response

A systematic visual impact assessment of Stage 2 was made using quantitative measures, which assessed the influence of landform, vegetation, water and other landscape factors on scenic quality. The full visual and landscape impact assessment is presented in EA Appendix 14 and is discussed in EA Section 5.13.

Stage 2 infrastructure and facilities, OC4 excavation, out-of-pit emplacement activities and related mining operations will be mostly not visible from publicly accessible viewpoints around the visual catchment. Views of Stage 2 will only be witnessed by drivers along Ulan-Wollar Road and will be temporary in nature. The majority of these viewers will be mine workers who are expected to have low sensitivity to mine disturbances.

No sensitive residential receivers will be affected as all properties in the vicinity of the project are mine-owned.

While the out-of-pit emplacements will become significant permanent elements in the landscape, their visual intrusiveness will be reduced through progressive rehabilitation. These features are not expected to be visible from publicly accessible areas outside the Murragamba Creek valley.

Where possible, MCM will investigate and implement the use of vegetation screening to reduce visual impacts.

Stage 2 will not have any impacts on views from the Goulburn River National Park or Munghorn Gap Nature Reserve in the local area, as areas within the park and reserve, that would provide views of Stage 2, are not easily accessible by the public. The proposed open cut and infrastructure areas will not be visible from any of the publicly accessible areas, such as the main lookouts, picnic areas or camping grounds, within the park or reserve.

To protect the aesthetic value of the Goulburn River and other aquatic systems downstream of the MCP, MCM has committed to implementing erosion and sediment control measures, capture and storage of contaminated water and site runoff in sedimentation ponds, maintaining environmental flows to Wilpinjong Creek (EA Section 5.6) and monitoring of all surface waters flowing from the site.

Rehabilitation will be progressively undertaken to replace the existing native vegetation that will be removed as part of the mining process. Other cleared and degraded areas within MCM-owned land will be revegetated to create a post-mining landscape with a greater proportion of native vegetation. A Rehabilitation and Offset Management Plan will be prepared to guide rehabilitation and revegetation efforts, and a Final Void Management Plan will be prepared to guide the final landform of the OC4 void. These plans will form part of the Landscape Management Plan for the MCP.

Some dams will be retained in the final post-mining landscape and converted to artificial wetlands to improve habitat and biodiversity potential.

3.7.2 Lighting Impact

Issues

- The lighting impacts from Stage 2 will extend and spread the overall lighting changes over a wide area and therefore increase the cumulative impact of lighting on the rural landscape.

Response

A nightscape assessment was conducted as part of the visual impact assessment (EA Section 5.13.5.4 and EA Appendix 14). The nightscape character of the study area was determined to be highly rural in character, comprising scattered residences with small concentrations of light at individual homesteads. The visual impact of lighting in the existing landscape was assessed to be low or negligible from all areas other than the mine infrastructure and working areas. Lighting for Stage 2 components will be shielded by topography and vegetation, including the ridgeline above UG1 and UG2, and will not directly impact on any private residences.

On overcast nights, the impact of lighting will be more evident as sky glow. This is already a significant element in the night environment due to the Wilpinjong and Ulan coal mines. Sky glow will be increased once the approved Stage 1 mine is operational. Night-time operations in OC4 will also contribute to sky glow in the area.

To minimise the effect of night lighting associated with both stages of the MCP, MCM has committed to implementing various measures (e.g., the installation of low brightness floodlights and wall-mounted lights and shielding floodlights in the open cut area to the maximum extent practicable) as detailed in EA Table 6.1.

3.7.3 Out-of-Pit Emplacements

Issues

- The significant impact of the large overburden emplacements as permanent changes to the landscape adjacent to Munghorn Gap Nature Reserve has not been addressed.

Response

Out-of-pit overburden emplacements are initially required to enable coal to be accessed in the open cut pit. Once there is sufficient void space available in the advancing open cut pit, overburden ahead of mine development will be emplaced in the void behind the active extraction area. Once out-of-pit dumping of overburden is complete, the out-of-pit emplacement areas will be stabilised, contoured and vegetated with endemic species. The final landform will blend with the surrounding landscape.

3.8 Social and Economic

3.8.1 Loss of Community and Voluntary Services

Issues

- The project will lead to depopulation of the area with a subsequent loss of:
  - Community or social fabric.
  - Organisations providing voluntary services to the wider community, e.g., fire-fighting and religious services.

Response

It is standard practice for large noise and dust generating activities such as manufacturing, industrial and mine developments to have buffer zones between the activity and surrounding sensitive receivers. For manufacturing and industrial developments, the location of development and establishment of buffers is directed through land use planning provisions within relevant environmental planning instruments. The discovery and development of economically viable mineral deposits is restricted to the occurrence and location of geological resources. Hence, for mine developments, buffers are usually created through the acquisition of surrounding properties.

Minor depopulation in the Ulan and Moolarben localities has occurred as a result of MCM's and the UCML's acquisition of properties to establish suitable mine noise and dust buffers. These acquisitions include all 16 residences within Ulan village and 23 other residences (which include vacant land) across the project areas (see EA Plans 2 and 2A). Some of these residences have since been demolished while others have been temporarily tenanted.

Aside from the loss of these residences, the local community base comprises scattered homesteads and close to 100 residences within a rural residential development located between 4 and 10 km south of Ulan village, southwest of the MCP (EA Plan 2). The occupancy rate of these residences is unknown but it is expected that the community comprises a mix of fulltime and weekend or holiday inhabitants.

Ulan village also comprises a small primary school, community hall, hotel and two small churches, one of which is unused. These facilities provide opportunity for community interaction for those residents with an interest in community involvement. Since the locality currently has no general store, food or fuel outlet, medical or other community services, opportunities for other community interaction are limited. Rather, it is expected that most community interaction occurs in the larger towns of Mudgee and Gulgong which have more established commercial, educational, religious, recreational and other social facilities and services (EA Section 5.14.5.4).

Recent property acquisitions by MCM has temporarily limited the need for rural fire services in the Ulan locality and equipment from the Ulan Rural Fire Service facility has been relocated to Cook's Gap area, temporarily. Moolarben Coal Mine has provided financial support to the Cook's Gap Rural Fire Service for the purchase of an additional fire-fighting vehicle. When the MCP is operational, fire-fighting personnel and equipment will be made available to assist in rural fire fighting, where required.

3.8.2 Social Value of Ecosystem Services

Issues

- The socio-economic assessment has not valued the ecosystem services that will be destroyed by the mine.

Response

Moolarben Coal Mines is committed to offsetting biodiversity impacts and is currently negotiating a suitable biodiversity offset package with the government. Moolarben Coal Mines is also committed to replacing or making good any loss to local water supplies as a result of the project, including environmental flows. It will also progressively rehabilitate the mine with local native vegetation species which will provide greater biodiversity opportunities than currently exist.

3.8.3 Community Consultation

Issues

- Moolarben Coal Mines interacted poorly with the community in relation to community consultation and complaints.

Response

Moolarben Coal Mines has endeavoured to keep the local community informed of its plans to develop Stage 2. This has included:

- Advertising the lodgment of the Major Project Application for Stage 2 in the *Mudgee Guardian* on 21 July 2008.
- A community information session (held locally on 23 to 25 July 2008).
- Various one-on-one consultation sessions with local community members.
- Consultation with local Aboriginal stakeholder groups.
- Community newsletters.
- Public exhibition of the EA.

Moolarben Coal Mines will continue to keep the community informed of its mine development and operations for the life of the project. This will be achieved through:

- Community newsletters.
- Community Consultative Committee (CCC) members reporting back to the wider community.
- Telephone hotline (1800 556 484).

- Publication of environmental reports and monitoring results, CCC minutes and general mine operation updates on its website (www.moolarbencoal.com.au).
- Newspaper advertisements and notifications, from time to time.
- Ongoing land access protocols.

Moolarben Coal Mines has employed an Environmental and Community Relations Manager (ECRM) who will provide the point of contact for community liaison, community complaints resolution and representation on the CCC.

3.8.4 Health and Stress Problems

Issues

- Mining will be a source of health deterioration and stress to local residents.

Response

Moolarben Coal Mines acknowledges that construction and operation of the MCP has the potential to cause some annoyance to certain members of the community. Moolarben Coal Mines is committed to using best practice environmental management to reduce the potential for impacts on the community and environment. It is also committed to working with the local community through the Stage 1 CCC, which it expects will be extended to include Stage 2, and ongoing community liaison (see Section 3.8.3) to limit opportunities for stress, annoyance and health risks during the establishment and operation of Stage 2.

3.8.5 Pressures on Accommodation and Social Services

Issues

- The EA did not adequately consider the impacts on housing and social services, such as medical facilities and schools, due to the introduction of a new population of workers and their families to Mudgee and Gulgong, nor did it assess the cumulative impact of these pressures in relation to Wilpinjong coal mine and Stage 1 operations.

Response

Moolarben Coal Mines is committed to employing local workers for the MCP, wherever possible. However, not all jobs can be sourced from the local employment pool due to the requirement for specialist skills. Hence, Stage 2 will result in the influx of some new employees and their families to the local area.

Construction of Stage 2 will be carried out as an extension of Stage 1 construction, which is currently underway. The impact of this construction workforce was considered in the assessment of Stage 1. Construction of Stage 1 was proposed to occur over an 18-month period. Moolarben Coal Mines anticipates that construction of both Stage 1 and most of Stage 2 will be completed within this same time frame. Construction employees are expected to use temporary and short-term accommodation services within the local region.

According to one regional tourist information service (http://www.visitmudgeeregion.com.au), there are approximately 870 rooms available in Mudgee and Gulgong in various types of short-term accommodation (i.e., bed and breakfasts, hotels, motels, self-contained apartments and

serviced apartments). There are also three caravan parks in Mudgee. Local hotel, motel and serviced apartment providers have indicated that room vacancy levels generally vary, but rooms can become fully booked, particularly on weekends with the influx of tourists.

As construction of Stage 1 has already commenced, some impact on short-term accommodation will have already occurred. It is expected this will have some effect on the availability of accommodation for casual visitors and tourists to the area, particularly during weekends. However, the number of potential rooms in short-term accommodation far out numbers that required for construction crews. As the construction workforce will be shared between Stage 1 and Stage 2, the effects on short-term accommodation from Stage 2 will be no greater than that expected for Stage 1 alone.

The impact of Stage 2 operations workers on housing was assessed in EA Section 5.14.5.4. A cumulative assessment of workforce numbers for both stages of the MCP conservatively predicts that approximately 282 of 439 potential total operations jobs will be sourced from outside the local area. This prediction assumes that 160 (50%) Stage 1 operations jobs (Wells Environmental Services, 2006) and 122 (100%) Stage 2 operations jobs will potentially relocate to the local area. Assuming that each employee has one partner and two dependant children, it is conservatively predicted that a total of 1,128 new persons will potentially relocate to the LGA. Of this number, three quarters (846) are predicted to move to Mudgee and one quarter (282) to Gulgong. This equates to a 10.3% and 14.8% cumulative increase in the populations of Mudgee and Gulgong, respectively and 4.4% and 6.4% increase in Mudgee and Gulgong, respectively, as a result of Stage 2 alone. However, some workers may opt to reside in other parts of the LGA, such as Kandos and Rylestone, or in rural areas reducing the predicted impact on Mudgee and Gulgong.

The cumulative impact of the integrated mine complex (Stages 1 and 2) with the Wilpinjong coal mine was not assessed. The Wilpinjong coal mine has been in operation since 2006 and the impact of Wilpinjong coal mine workers on local housing is expected to have been absorbed into the local housing market already.

Based on the above discussion, the conservatively predicted cumulative influx of Stage 1 and Stage 2 operations employees will require approximately 282 homes. This potential housing demand will be staged in line with the mine commissioning times for Stage 1 and Stage 2 and the subsequent staged commensurate requirement for operations workers.

According to the Property Shop (a local Mudgee real estate agent), in late May 2009 there were around 200 houses in Mudgee and 64 in Gulgong for sale. Further, 150 vacant building blocks (land parcels of approximately 800 m^2) were available for new housing construction, in Mudgee and Gulgong combined. There was only a 3% rental vacancy rate in Mudgee (equating to approximately 40 properties), with a similarly low percentage expected in Gulgong (equating to approximately 10 to 15 properties) in late May 2009. The available rental accommodation comprises mostly 2 and 3-bedroom properties.

According to the Mudgee Housing Manager of Central Tablelands Housing Association, Andrew Daley, in late May 2009 there was only one new affordable housing development proposed between the two towns. A private developer has lodged plans with MWRC for 25 private units for persons in the low to middle income bracket. However, due to zoning restrictions, this development is unlikely to proceed (Daley, pers. com., 2009).

New housing is also proposed as part of the Nation Building – Economic Stimulus Plan, which will be supported financially by the Commonwealth and NSW governments. Some 9,000 houses across NSW will be delivered under this plan, although in late May 2009, the location of these houses has not been determined.

The above information confirms that although there is likely to be increased pressure on housing availability in the short term, there will be an adequate stock of housing available for workers that may relocate to the area for both stages of the MCP. This is not expected to affect availability of housing in the lower price bracket as mine workers are not expected to buy houses in the lower price range. Further, increased housing demand is likely to see an increase in house building over time, which will maintain employment in the local building sector.

The predicted potential influx of new mine workers and their families may also add pressure on local medical services. According to MWRC, there is generally a 3 to 4-week waiting period for general practitioners (GPs) in Mudgee. Further, there are few medical specialists available due to the discontinuation of flights to Mudgee.

Mudgee Hospital provides some specialist services as does Gulgong Hospital, although the latter has limited facilities, routinely sending patients to Mudgee Hospital. Mid-Western Regional Council continues to lobby the State government to provide more help to the area including securing more funding for additional doctors. In order to fly specialists in, MWRC is also looking into re-establishing flights to the area.

Moolarben Coal Mines is aware that a new specialist facility is currently under construction, which is expected to be completed early next year. This will contain specialist rooms and provide better medical services generally. While the lack of flights may have restricted some specialist services, specialists from Bathurst and Orange are continuing to provide services in the area.

It is conservatively estimated that the influx of mine workers and their families will result in an additional 423 and 141 children residing in Mudgee and Gulgong, respectively. According to the School Education Director of the Department of Education and Training, Michael Cronk, local educational facilities can easily accommodate this increase. However, if needed, new classrooms, teachers, and specialists can be brought in, in a very short space of time. There are also a number of private education facilities in the local area, which would also be expected to accommodate new students. A number of major infrastructure programs are currently underway which includes a building program for new school facilities (Cronk, pers. com., 2009).

According to the Head of Administration at Mudgee TAFE (the only college in the area), Murry Dukes, the ability for the TAFE to enrol new students would depend on a number of factors including student numbers, whether classes would be taken during the day or evening, which subjects would be taken, and the method of schooling e.g., full-time, part-time, or via correspondence. In late May 2009, the TAFE had enrolments for 3,000 students and had building expansion works underway (Dukes, pers. com., 2009).

Moolarben Coal Mines has entered into a VPA with MWRC for Stage 1 and is currently finalising the terms of a similar agreement for Stage 2 (refer to EA Section 5.14.6). The total of these agreements is expected to be in the vicinity of nearly $6 million, which MCM will provide to MWRC over the life of the project. Moolarben Coal Mines expects that MWRC will use these funds to provide local community services, and fund community infrastructure projects. This may

include alleviating pressure on housing and social services, as well as road maintenance, and other needs in the local area and throughout the LGA.

3.8.6 Economic, Business and Employment Effects

Issues

- Employment and investment should be directed to other types of industries or energy sources (e.g., renewable energy sources).
- Economic benefits to the region, state, and federal governments outlined in the Stage 1 EA report have yet to commence.

Response

It is not appropriate for MCM to comment on the investment decisions of government or other entities.

The Stage 2 Project Area contains an economically viable coal resource, which MCM proposes to mine in conjunction with coal from Stage 1 to contribute to meeting the domestic and international demand for coal (see Section 3.2).

The benefits from mining the Stage 2 coal resource include the creation of direct and indirect employment opportunities, as well as royalties and taxes paid to the various tiers of government. The monies received by government will be reinvested in the broader community to maintain or enhance standards of living.

In addition, MCM has also committed to:

- Employing local people, wherever possible.
- Providing an unbiased employment program which:
  - Encourages women to become part of the Stage 2 workforce.
  - Encourages indigenous Australians to become part of the Stage 2 workforce.
  - Provides traineeships for young persons residing within the MWRC area.
- Supporting local businesses through the sourcing and use of materials, equipment and services from the local area, wherever possible (see Section 3.8.9).
- Providing a staged financial contribution to MWRC for the community services and infrastructure.

3.8.7 Tourism

Issues

- The MCP will have a permanent detrimental impact on existing tourism and the potential for tourism in the local area.
- Additional mining operations will compromise the great potential of the fertile valley to be a major tourism area.

- The MCP will have a permanent detrimental impact on the Goulburn River Stone Cottages, an ecotourism business.
- The MCP will result in the loss of tourism access to the Goulburn River Gorge.

Response

The majority of land on which Stage 2 will be developed is owned by MCM and UCML and at some time in the past, the majority of this land had been cleared for grazing. There are no prime agricultural lands within either the Stage 1 or Stage 2 Project Areas and there are no existing or proposed tourist attractions within either of these areas. Apart from those areas that front the Ulan-Wollar Road, no other parts of the Stage 2 Project Area is readily accessible or visible to the general public (see Section 3.7.1). Stage 2 is at least 6 km from The Drip area and will not impact on the existing public access to this area.

The Stone Cottages ecotourism business is located about 6.5 km north of the closest point of proposed Stage 2 open cut mining, and about 5.5 km from the Stage 1 Infrastructure Area. The adjacent Ulan coal mine, which has been well established in the area for many years, is located a similar distance from the Stone Cottages ecotourism business.

3.8.8 Uncontrolled Growth

Issues

- The local area will be subject to rapid growth with the uncontrolled frenzy of mining before becoming a ghost town.

Response

Stage 1 has approval for 21 years (until 2028) and MCM is now seeking a 24-year approval for Stage 2, until 2033. Wilpinjong coal mine is approved to operate until about 2027 and UCML has recently lodged an application to continue its operations for a further 21 years.

The ability to mine and supply coal to market is dependent on a number of factors, including market demand, approved mining and production rates and the ability to deliver coal to market. If the MCP (or any of the other mines) does not progress at the anticipated production rates, this will have the effect of extending the potential life of the mine. It is also expected that additional coal resources will be developed within current exploration areas in the future. This will extend the life of the MCP (and the other mines) beyond that currently approved and proposed.

The majority of workers at the MCP are expected to reside in Mudgee and Gulgong. A certain percentage of these will be existing inhabitants. Mudgee and Gulgong are not solely reliant on mining to support employment. While mining offers additional employment opportunities and other economic benefits to the local area, it is not expected that either of Mudgee or Gulgong will become ghost towns, or that the local area will become deserted once mining at the MCP is complete.

3.8.9 Social Impacts yet to be Tested

Issues

- Social impacts from Stage 1 have yet to be tested.

Response

Moolarben Coal Mines is committed to supporting local service providers and the community. Stage 1 is currently under construction and entails the expenditure of several hundred million dollars. Moolarben Coal Mines will spend around $50 million during construction of the MCP to June 2010; MCM is looking to spend much of this locally. The MCP General Manager, Ian Livingstone-Blevins, has communicated that MCM would prefer to use local contractors where possible, as evidenced in an article published in the *Mudgee Guardian* on 14 April 2009.

3.8.10 Political Donations

Issues

- Felix Resources did not list their donations to political parties in any of the documents on public exhibition.

Response

The Stage 2 planning application was made prior to the requirement for political donations to be disclosed. Moolarben Coal Mines has disclosed all political donations to the DoP in relation to the application to modify Stage 1.

3.8.11 Voluntary Planning Agreement

Issues

- The voluntary planning agreement (VPA) offered for Stage 2 is in staged payments with payments not commencing until after the combined mining operations reach 10 Mtpa coal production.
- The VPA is highly inadequate and does not compensate for the additional impact to the amenity of the area should 10 Mtpa production not be reached.

Response

The VPA commits MCM to contribute certain funds to MWRC for general community enhancement projects. The Stage 2 VPA will be in addition to the Stage 1 VPA, which, when combined, will contribute nearly $6 million to MWRC.

Moolarben Coal Mines and MWRC are still negotiating the final terms of the VPA for Stage 2. The current proposition is for MCM to contribute $68,250 to MWRC on an annual basis for twenty years, commencing on the second anniversary of transporting coal from the site. This is additional to the contributions MCM will pay MWRC for Stage 1, and will be adjusted annually in line with increase in the consumer price index. Once the VPA is agreed to, it will be advertised by MWRC and public comment will be invited.

3.9 Land Use

3.9.1 Land Capability, Agricultural Suitability

Issues

- Additional mining operations will compromise the great potential of the fertile valley to be a major agricultural production area.

Response

A soil, rural land capability and agricultural suitability assessment for Stage 2 was conducted by JAMMEL Environmental and Planning Services and is presented in EA Appendix 11. Land capability was evaluated against the NSW eight class land capability system, while agricultural suitability was assessed against agricultural land classifications mapped by the DPI. Agriculture was found to be the prevailing land use on the valley floor of the Stage 2 Project Area. However, this land was determined to be capable of only supporting grazing and occasional cultivation (with land improvement) at best. Hence, there is no prime agricultural land within the Stage 2 Project Area.

While a loss of low class agricultural land is expected with Stage 2, it is the intent of MCM to rehabilitate and revegetate mined and cleared lands to a natural state, increasing the ecological and biodiversity values of the land in the process.

3.10 Rehabilitation

3.10.1 Rehabilitation of Disturbed Areas

Issues

- Current coal mining methods remove the top layer of soil, leaving unattractive landscapes that are useless for crops, vines, raising thoroughbreds or attracting tourists.

Response

Topsoil is a valued resource that will be collected, stored and reused in the rehabilitation of the site. Specific management protocols will be prepared to guide stripping, handling and stockpiling so that the fertility and productive value of the soil is maintained and/or improved.

Moolarben Coal Mines' intention for the post mining landscape is to rehabilitate the Stage 2 Project Area with native vegetation. The land will not be returned to its existing pre-mine state (i.e., disturbed agricultural land). The Stage 2 Project Area is currently not used for crops, vines, raising thoroughbreds or attracting tourists, nor is it currently in a condition to support such activities.

All cleared and disturbed land within the ownership of MCM that is not directly disturbed by mining will be rehabilitated with a mosaic of native open woodland, grassland and shrubland, including endemic endangered ecological community (EEC) species. This will enhance the biodiversity values of the area in the long term and provide wildlife corridors.

It is envisaged that post-closure, rehabilitated and revegetated areas will be used for conservation, passive recreation, and environmental education purposes. The final landform will

be designed and constructed so that the post-mining rehabilitated landscape is self-sustaining, with no ongoing maintenance requirements.

A rehabilitation management plan will be developed as part of the Landscape Management Plan for the site. This will establish the schedule for progressive rehabilitation of mined areas and the final completion criteria for the rehabilitated post-mining landscape.

3.11 Mine Closure

3.11.1 Final Void

Issues

- The DPI notes that Wilpinjong coal mine and Stage 2 propose final voids in close proximity to each other and recommends that MCM coordinate with Wilpinjong coal mine to ensure that only one void exists at the end of mining.
- The long-term rehabilitation of subsided land across the region does not appear in any of the mitigation or mine closure plans.

Response

Moolarben Coal Mines has committed to preparing a Final Void Management Plan, which will guide the design and construction of the final void. It is the intent of MCM that the post-mining void shape be influenced by the final configuration of the Wilpinjong coal mine area, which is currently unknown. Moolarben Coal Mines will seek to enter into a co-operative arrangement with Wilpinjong coal mine to ensure that only one void will exist in the vicinity of the Stage 2 eastern project boundary.

A summary of the mitigation measures for subsidence that will be implemented is included in EA Table 5.8.1. The Subsidence Management Plan will elaborate on these measures and any long-term rehabilitation that may be required.

Moolarben Coal Mines is committed to effective long-term rehabilitation as stated in EA Section 5.18.

3.12 Other

3.12.1 Presentation of the Environmental Assessment

Issues

- It is difficult to locate specific properties in EA Plan 2 and property ownership is not listed alphabetically or numerically.

Response

The same format of individual properties, residences and land ownership that was used in the Stage 1 EA was used for the Stage 2 EA for ease of comparison and referral. Property ownership has been listed in the plan in order of numerical reference assigned to each property.

3.12.2 Preliminary Risk Assessment

Issues

- The DPI states that the risk analysis does not indicate what constitutes an unacceptable risk.

Response

The level of risk associated with each issue identified was determined from the consequence and probability analysis. Where applicable, the issues with a high risk were included in the scope of work for various specialist studies to ensure that potential impacts and management measures were considered.

In addition, six hazardous incidents, determined as high risk, were carried forward to the hazard analysis. It was determined that none of these incidents would result in off-site consequences. Despite the fact that no off-site consequences were predicted, various measures will be adopted to ensure that risks are reduced to as low as reasonably practicable.

3.12.3 Cumulative Impacts

Issues

- The EA fails to address the Director-General's Requirements to include 'any cumulative impacts associated with concurrent operations of the project with any other existing or approved mining operations in the region'.
- The EA attempts to dismiss cumulative impacts by identifying the region as being primarily a mining landscape and therefore not worth consideration.

Response

The specialist studies and EA addressed the incremental impacts of Stage 2 and the Stage 1 modification, but also addressed cumulative impacts in detail. The impacts of dust, noise, groundwater, Aboriginal heritage, transport and biodiversity in particular focussed on cumulative impacts. The approach to cumulative impacts depends on the discipline involved, with the cumulative impacts incorporated into the determination of the baseline or existing environment, or used to contextualise impacts, actions, monitoring or mitigation.

Moolarben Coal Mines acknowledges that there will be a cumulative impact on the landscape through the addition of the MCP, which is positioned between the Wilpinjong and Ulan coal mines. However, Stage 2 will not be discordant with existing and approved land uses which have been modified by the Stage 1 and the adjacent coal mines.

3.12.4 Boundary Conflict for Mining Lease 331

Issues

- There is potential conflict in the application for a mining lease application (MLA331) over the Corner Gorge, Goulburn River (EL 7074), an area previously identified by the Independent Hearing and Assessment Panel (IHAP) report as being part of a protective buffer zone for this gorge. As a result of IHAP recommendations, MCM agreed to increase the buffer zone between the mine workings and Corner Gorge to 450 m. MLA331 contradicts that undertaking.

- Mining Lease Application 331 presumes development approval when the Stage 2 – No: 08_0135 (and Modification Stage 1 – No: 05_0117 MOD 3) is still currently being assessed by the DoP and the DECC. This mining lease should be not considered by the Department of Primary Industries – Mineral Resources (DPI-MR) before the DoP has been able to complete both a rigorous and transparent process that would include, should an approval be granted, extensive conditions of consent that may have a significant affect on any mining lease boundary.

Response

Moolarben Coal Mines has amended its mining lease application (MLA) so as not to include the area over the Corner Gorge and Goulburn River. The MLA will not be determined until after a determination is made on the project application by the Minister for Planning.

3.12.5 Employment of Department of Planning Staff

Issues

- A senior Department of Planning officer is a consultant for MCM apparently to use contacts and experience in framing the company's response to our objections.

Response

No officer of the DoP has been engaged to assist MCM in preparing documents to support its project application.

3.12.6 Contradiction of Ecologically Sustainable Development (ESD) Principles

Issues

- The DPI state that the existence of previous mining should not be allowed to be a reason to increase mining impacts on the landscape. This reasoning contradicts cumulative impact and ESD principles.

Response

Moolarben Coal Mines expects that the Stage 2 Project Application will be determined on the basis of the merits of the proposal. This decision will be made by the Minister for Planning upon weighing up the benefits against the impacts of the project proposal.

3.12.7 Construction Work Hours

Issues

- The hours to be worked during the construction phase of Stage 2 needs clarification.

Response

The EA Section 4.5.12.2 stated that hours of construction will be from 7.00 a.m. to 6.00 p.m., seven days a week, and that 24-hour construction activities may be required at some time during Stage 2 construction. It is MCM's intention now to seek approval for 24-hour construction, seven days a week.

3.12.8 Interaction with UCML Land Holdings

Issues

- Moolarben Coal Mines proposes to conduct a number of mining and related activities associated with the MCP on UCML-owned land.

Response

Moolarben Coal Mines is currently negotiating an agreement with UCML to enable Stage 2 development on UCML-owned land. It will also employ best environmental management practices to ensure that the impacts of Stage 2 do not compromise off-site UCML land holdings.

3.12.9 Access to Private Land Holdings

Issues

- The proposed development will make accessing private land holdings in the Murragamba Creek valley more difficult.

Response

Moolarben Coal Mines is in negotiation with the affected land owner to ensure that access to private land holdings within the Murragamba Creek valley is maintained.

3.12.10 Consideration of the Ulan Continued Operations Project in the Impact Assessments

Issues

- Various impact assessments from the EA (including air quality, noise and rail traffic) did not consider the Ulan Continued Operations Project.

Response

The Director-General's Requirements state that an assessment of key issues should include:

> [A]n assessment of the potential impacts of all stages of the project, including any cumulative impacts associated with the concurrent operation of the project with any other existing or approved mining operations in the region.

The Director-General's Requirements do not require the impact assessment to consider projects still awaiting approval, such as the Ulan Coal Continued Operations Project.

3.12.11 Precautionary Principle

Issues

- The EA does not apply the precautionary principle.

Response

The method of assessment used in the EA is based on a worst-case or conservative approach. This aligns with the precautionary principle.

3.12.12 Consideration of Project Alternatives

Issues

- Project alternatives analysed in EA Section 7.3.5 are based on cost rather than mitigation of irreversible environmental damage.

Response

Project alternatives considered as part of the project feasibility studies were assessed based on engineering design, environmental, social and economic considerations. Moolarben Coal Mines believes that the project described and assessed in detail in the EA represents the best balance of the aforementioned factors. EA Table 7.1 includes environmental factors where they assist to differentiate between alternatives.

3.12.13 Run-of-Mine Coal

Issues

- The EA does not explain why Stage 2 has such a large ratio of coal reject (i.e., 5 Mtpa run-of-mine (ROM) coal to produce 3 Mtpa saleable product). This indicates that the coal being mined in Stage 2 is of questionable quality.

Response

Up to 12 Mtpa ROM coal from OC4 and 4 Mtpa ROM coal from underground mining (UG1 and UG2) will be mined from Stage 2 at full production. This is in addition to the 8 Mtpa open cut ROM coal and 4 Mtpa underground ROM coal approved in for Stage 1. However, mining in both Stage 1 and Stage 2 will be carried out in a coordinated manner such that the total amount of coal mined across the complex will not exceed 13 Mtpa open cut ROM coal and 4 Mtpa underground ROM coal.

3.12.14 Other

Issues

- The entire justification for Stage 2 is based on economic arguments in favour of the proponent and shareholders. The points in EA Section 7.3.1 do not indicate why Stage 1 does not give flexibility in delivery of different product coals with differing ash contents or why Stage 1 does not meet contractual obligations as an equity participant in the Newcastle Coal Infrastructure Group (NCIG).

Response

Stage 2 and the integrated MCP will deliver social and economic benefits to the local community, region, state and nation. These benefits include direct employment opportunities for local and regional residents, increased opportunities for local and regional service providers, financial contributions paid to MWRC for local road maintenance and upgrades and other community infrastructure. Money paid in royalties and through taxes supports State and federal government and provides services back to communities.

Stage 1 and Stage 2 will extract coal from the same coal seams. All coals from the MCP have the capacity to provide varying ash content products and will be used to fulfil obligations under NCIG agreements.

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5. ABBREVIATIONS

A

AADT average annual daily traffic

ANZECC Australian and New Zealand Environment and Conservation Council

ARAS Archaeological Risk Assessment Services Pty Ltd

ARTC Australian Rail Track Corporation

C

CCC Community Consultative Committee

CMA Hunter-Central Rivers Catchment Management Authority

CO_2 carbon dioxide

CSIRO Commonwealth Scientific and Industrial Research Organisation (Commonwealth)

D

dB decibel

DCC Department of Climate Change (Commonwealth)

DECC Department of Environment and Climate Change (NSW)

DEWHA Department of Environment, Water, Heritage and the Arts (Commonwealth)

DM dust monitor

DoP Department of Planning (NSW)

DPI Department of Primary Industries (NSW)

DPI-MR Department of Primary Industries – Mineral Resources (NSW)

DWE Department of Water and Energy (NSW)

E

EA Environmental Assessment

ECRM Environmental and Community Relations Manager

EEC Endangered Ecological Community

EET Emissions Estimation Technique

EL Exploration Licence

EPA Environment Protection Authority (NSW)

ESD Ecologically Sustainable Development

G

GP general practitioner

Gt gigatonne

H

ha hectares

I

IHAP Independent Hearing and Assessment Panel

IPCC Intergovernmental Panel on Climate Change

J

JAMMEL JAMMEL Environmental and Planning Services Pty Ltd

K

kg kilograms

km kilometres

kPa kilopascal

kW/m^2 kilowatt per square metre

L

LGA Local Government Area

M

m metres

MCM Moolarben Coal Mines Pty Ltd

MCP Moolarben Coal Project

MIC maximum instantaneous charge

MLA Mining Lease Application

Mt million tonnes

Mtpa million tonnes per annum

MWRC Mid-Western Regional Council

N

NCIG Newcastle Coal Infrastructure Group

NPI National Pollutant Inventory

NSW New South Wales

O

OC open cut

P

PAD potential archaeological deposit

PM_{10} particulate matter with a diameter less than 10 micrometres

R

ROM run-of-mine

RTA Roads and Traffic Authority (NSW)

S

SCMP Spontaneous Combustion Management Plan

T

TEOM Tapered Element Oscillating Microbalances (dust monitor)

TSP total suspended particulate matter, usually in the size range of zero to 50 micrometres

U

UCML Ulan Coal Mines Limited

UG underground

V

VKT vehicle kilometres travelled

VPA voluntary planning agreement

W

WS weather station

Appendix 1

References of Issues Raised by Submission

Submissions Received	Reference of Issues Raised
Government Agency	
Department of Environment of Climate Change	3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7, 3.1.8, 3.3.2, 3.4.6 Part B
Department of Water and Energy	Part B
Department of Primary Industries	3.11.1 Part B
Department of the Environment, Water and Heritage	Part B
Hunter-Rivers Catchment Management Authority	3.4.1, 3.12.2, 3.12.6 Part B
Mid-Western Regional Council	3.1.2, 3.4.1, 3.4.2, 3.5.1, 3.6.1, 3.6.3, 3.7.1, 3.8.1, 3.8.5, 3.8.6 Part B
Roads and Traffic Authority	3.6.1, 3.6.3
Corporate	
Xstrata Coal	3.1.6, 3.1.8, 3.6.1, 3.12.8, 3.12.10 Part B
Individuals	
Adler, N.	3.4.1, 3.4.4, 3.5.1, 3.7.1 Part B

Submissions Received	Reference of Issues Raised
Albury, A.	3.3.1, 3.7.1, 3.8.6, 3.10.1 Part B
Ambler, S.	3.2.2, 3.4.1, 3.8.7, 3.9.1 Part B
Anderson, M	3.1.2, 3.3.1, 3.4.1, 3.4.2, 3.5.1, 3.7.1, 3.8.1, 3.8.7 Part B
Arnott, W. and Pavich, C.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.8.4 Part B
Atkinson, B.	3.2.2, 3.2.4
Barlow, C.	3.1.2, 3.3.1, 3.4.1, 3.4.2, 3.8.4 Part B
Barlow, D.	3.2.2
Batey, L.	3.12.1 Part B
Bick, G.	3.2.2, 3.4.1, 3.5.1, 3.7.1 Part B
Binns, B.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.4 Part B
Brasseur, E.	3.1.2, 3.2.2, 3.7.1, 3.8.4 Part B
Cleary, M.	3.2.2, 3.8.6 Part B
Day, S.	3.2.2, 3.2.4

Submissions Received	Reference of Issues Raised
Dunphy, D.	3.2.2
Ealing, L.	3.2.2, 3.8.4, 3.8.6 Part B
Ellis, J.	3.2.2, 3.8.6
Gant, L.	3.4.1, 3.5.1, 3.8.1 Part B
Goonrey, T.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.4 Part B
Goulburn River Stone Cottages	3.1.1, 3.1.2, 3.2.4, 3.4.1, 3.5.1, 3.6.3, 3.7.1, 3.8.1, 3.8.7 Part B
Haines, A.	3.2.2, 3.4.1, 3.4.2 Part B
Handicott, F.	3.1.2, 3.6.3 Part B
Harris, J.	3.8.4 Part B
Hefford, L.	3.4.1, 3.5.1, 3.7.1 Part B
Higgins, B. and M.	3.4.1, 3.5.1, 3.7.1 Part B
Hope, M.	Part B
Hulme, J.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.1, 3.8.4, 3.8.6 Part B

Submissions Received	Reference of Issues Raised
Imrie, C.	3.2.1, 3.2.2, 3.2.4, 3.4.1, 3.5.1, 3.7.1, 3.8.10, 3.9.1, 3.12.5 Part B
Imrie, J.	3.2.2, 3.2.4, 3.4.1, 3.4.2, 3.4.3, 3.4.4, 3.5.1, 3.7.1, 3.12.4 Part B
Imrie, T.	3.2.2, 3.4.1, 3.5.1, 3.7.1, 3.8.7 Part B
Jan, B.	3.2.2, 3.4.1, 3.5.1, 3.7.1, 3.8.7 Part B
Jury, F.	3.2.2
Kingston, P.	3.4.1, 3.5.1, 3.7.1 Part B
Lawson, J.	3.2.2, 3.4.1, 3.5.1, 3.7.1, 3.8.7 Part B
Lewis, J.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.1 Part B
Lewis, S.	3.1.2, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.1, 3.4.2, 3.7.1, 3.8.1 Part B
Lloyd, R.	3.8.2 Part B
Luckhurst, F.	3.1.2, 3.3.1, 3.4.1, 3.4.2, 3.8.1 Part B
MacLeod, M.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.4 Part B
Madigan, R.	3.2.2, 3.2.4

Submissions Received	Reference of Issues Raised
Mayberry, K.	3.1.2, 3.3.1, 3.9.1 Part B
McGuire, T.	3.2.2, 3.2.4
McPhee, J. and K.	3.4.1, 3.5.1, 3.7.1 Part B
More, J.	Part B
Munro, S.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.1, 3.8.4, 3.8.6 Part B
Mushalik, M.	3.2.2, 3.2.4
Nutting, B.	Part B
O'Connor, F.	3.2.2, 3.7.1, 3.8.6, 3.9.1, 3.10.1
O'Mara, D. and P.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.5.1, 3.8.1, 3.8.4 Part B
O'Neill, R. and S.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.7.1, 3.8.4 Part B
Pattulo, C. (on behalf of Cumbo Creek valley residents)	3.1.2, 3.8.4 Part B
Peters, A.	3.2.2 Part B
Rayner, D.	3.9.1

Submissions Received	Reference of Issues Raised
Rose, P.	3.2.2, 3.2.4
Ryan, C.	3.2.2, 3.2.4
Stanford, R.	Part B
Schofield, N.	3.2.2, 3.4.1, 3.5.1, 3.7.1
Sedgwick, P.	3.2.2
Sellers, C.	3.2.2, 3.2.4
Setchell, P.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.4, 3.9.1 Part B
Stone, K.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2 Part B
Swords, H and M.	3.1.2, 3.3.1, 3.4.1, 3.4.4, 3.5.1, 3.6.1, 3.6.3, 3.7.1, 3.8.6, 3.9.1, 3.10.1, 3.12.7, 3.12.9 Part B
Symons, S.	3.1.2, 3.2.2, 3.6.3, 3.7.1, 3.8.4, 3.8.6, 3.8.8, 3.9.1, 3.10.1 Part B
Thomson, B.	3.1.2, 3.2.2, 3.3.1, 3.4.1. 3.4.2, 3.8.4
Tuck-Lee, G.	3.8.3
Tyler-Olsen, L.	3.2.2, 3.2.4

Submissions Received	**Reference of Issues Raised**
Wales, W.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.7.1, 3.8.1 Part B
Walsh, R.	3.8.3 Part B
Walter, I.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.4 Part B
Watson, K. and S.	Part B
Whalley, B.	Part B
White, W.	3.1.2, 3.2.2, 3.4.1, 3.4.2, 3.7.1, 3.8.4 Part B
Wiggins, S.	3.2.2, 3.4.1, 3.5.1, 3.7.1 Part B
Woodhead, A. and L.	3.1.2, 3.6.1, 3.6.3, 3.7.1
Wright, C. and Mobbs, P.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.4.3, 3.4.4, 3.6.4, 3.8.1, 3.8.7 Part B
Special Interest Groups	
Bathurst Community Climate Action Network Inc.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.1, 3.8.6 Part B
Central West Environment Council	3.1.2, 3.3.1, 3.4.5, 3.8.1, 3.12.3, 3.12.13 Part B
The Greens NSW	3.2.1, 3.2.2, 3.4.1, 3.4.2 Part B

Submissions Received	Reference of Issues Raised
Hunter Environment Lobby Inc.	3.1.2, 3.4.4, 3.4.5, 3.6.4, 3.7.1, 3.7.2, 3.8.4, 3.12.13 Part B
Johnsons Creek Conservation Committee Inc.	3.1.2, 3.2.2, 3.3.1, 3.4.1, 3.4.2, 3.8.1, 3.8.4 Part B
Joint Climate Action Groups	3.1.2, 3.2.1, 3.2.2, 3.3.1, 3.4.1, 3.8.1, 3.12.11 Part B
Mudgee District Environment Group	3.1.2, 3.1.3, 3.1.9, 3.2.1, 3.3.1, 3.4.4, 3.4.5, 3.6.1, 3.6.2, 3.6.3, 3.7.2, 3.7.3, 3.8.1, 3.8.2, 3.8.3, 3.8.9, 3.8.11, 3.9.1, 3.10.1, 3.11.1, 3.12.12, 3.12.3, 3.12.11, 3.12.13, 3.12.14 Part B
Minewatch NSW Inc.	3.1.9, 3.2.1, 3.3.1, 3.8.4 Part B
National Parks Association of NSW	3.1.2, 3.2.2, 3.3.1, 3.4.3, 3.4.4, 3.5.1, 3.7.2 Part B
Nature Conservation Council of NSW	3.2.1, 3.2.2, 3.4.1, 3.8.1 Part B
Orange Field Naturalist and Conservation Society Inc.	3.1.2, 3.2.2, 3.4.1, 3.4.2 Part B
Orange Climate Change Action Now	3.2.2
Rivers SOS	Part B
The Wilderness Society	3.2.1, 3.2.2, 3.4.1, 3.4.2, 3.8.5 Part B

Appendix 2

Dust Control Modelling Assumptions

20 July 2009

Coffey Natural Systems
Level 1, 3 Rider Boulevard
Rhodes
NSW 2138

Attention: Philip Towler

Dear Philip

Reply to queries on dust control assumptions for Moolarben Stages 1 and 2

Introduction

I understand that the Department of Planning has identified some inconsistencies in the text of the air quality assessments particularly in the appendices.

The inconsistencies have arisen because we have investigated a number of dust control options for Moolarben Stage 1 and 2 and the material in the appendices do not appear to have been updated to reflect all the changes.

The following explains in more detail why we did what we did and what our view is in relation to dust control on haul roads.

Basic assumption and can the assumed dust controls be achieved?

Firstly, it may be useful to make some general comments on dust control on haul roads on mine sites.

The emission factor for a haul road, which is used to estimate the quantity of dust liberated from a haul road for inventory and modelling purposes, depends on the nature of the material that makes up the surface of the road (in particular the silt (sub-75 micron particles) content) and other factors such as the weight of trucks, the number of wheels on the trucks and the level of control achieved either through the application of water or through the application of chemical dust suppressants (usually with water).

The characteristics of the roads will vary from mine to mine and from place to place on a given mine. There is therefore a limit to the detail that can realistically be incorporated in to a modelling study of a proposed mine.

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The speed of trucks and the speed of the wind will also play a role. However, neither of these two factors appears directly in any of the available emission factor equations. This is obviously a refinement that may be included in the future. For the present, we have to assume that the equations apply provided the truck speeds and wind condition are not abnormal. In the case of Moolarben, I consider that truck speeds and wind condition would be in the normal range.

The technical literature on fugitive dust emissions from vehicles presents information on typical controls that can be achieved. (I note that that this information is discussed in some detail in Section 3 of the response to submissions report which I have reviewed). I am not able to add further to this aspect of the problem except to note that control efficiencies of 50% appear to be very easy to achieve using water alone. Controls of 75% appear to be standard in the Hunter Valley, and easily achieved with the right commitment and expenditure on water trucks etc. I say this because we get good agreement between the predicted annual average PM_{10} concentrations and measured concentrations in the EAs that we have done recently in the Hunter Valley and we normally assume that the level of control will be 75%, which is equivalent to 1 kg of TSP/VKT.

The technical literature referred to in Section 3 of the response clearly shows that 90% control can be achieved using water alone. The problem with assuming that this could be achieved routinely is that road surfaces become slippery when too wet and mining vehicles often have to negotiate steep gradients and sharp bends. Also in some cases access to sufficient water may limit the level of control that can be achieved with water alone. Committing to chemical treatments involves additional costs but can overcome these problems.

For the Stage 1 assessment, we understood that the water supply was “tight” but that there would be sufficient to achieve the 75% control commonly achieved in the Hunter Valley. Stage 2 significantly increased the area of haul road that would require watering and we initially conservatively assumed that the control achievable would be 50% -i.e. the “tight” water supply would be even “tighter”.

(Some modelling at 75% control was conducted initially, but never finalised because of the concern about water availability i.e. 75% control might not be achieved. With the commitment to chemical treatment we have assumed 85% control because this appears to be a reasonable estimate of what will be achieved once a commitment to chemical treatment is made.)

To reduce the area around the mine affected by dust, the effect of better controls on haul roads was tested (using modelling). The concern over water availability for the larger mine still remains, but since the project has committed to the use of chemical dust suppressants and based on our review of the technical literature we proceeded on the basis that 85% would be achievable.

The proponent and PAEHolmes have both had discussions with a company (RST) that supplies a range of dust chemical suppressants and specialises in providing advice on the use of the chemicals on mine sites for this purpose. RST have international experience in this area.

The type of suppressant that would be used would need to be tailored for the particular roads being treated, but we expect that the suppressant would be a bitumen-like hydrocarbon that is applied to the road as water-based emulsion. The concentration and the frequency of application would be determined by on site testing. The emulsion permeates the road surface and binds the fine particles together thus suppressing dust and reducing the need to water the road. The effect is similar to the old method (no longer environmentally acceptable) of applying oil to the road surface. The resulting road surface is flexible. The dust suppression effect is not a consequence of a crust being formed. (In one of the points raised by the Department there was a concern expressed that the suppression effect depended on crust being formed and that this could be easily broken).

The precise level of control achieved will depend on site conditions. However the assumed level of control (85%) appears to be achievable in a practical sense even in an environment where water may be scarce provided the commitment to chemical treatment is made.

I am confident that the residences along Ridge Road will not experience levels above the concentration and deposition levels used in Hunter Valley conditions of consent for coal mines, if these measures (chemical treatment) are in place and the mine was operated at the production levels assumed in the EA.

Conclusions

With the assumption of 85% control on the haul roads the project is predicted to comply with the DECC's 30 $\mu g/m^3$ with a reasonable margin and to also to comply with 24-hour 50 $\mu g/m^3$ for PM_{10} (due to the project alone) at the residences in the Ridge Road area. These are the residences that initially prompted the search for improved control measures. I also note that strictly meeting the 85% level of control is not required to achieve compliance in the Ridge Road area.

Yours sincerely
PAEHolmes

Nigel Holmes
Atmospheric Physicist