SECTION 1 INTRODUCTION

1.1 SCOPE

1.1.1 Outline

This Statement of Environmental Effects (SoEE) has been prepared in support of an application by Whitehaven Coal Mining Limited (WCM) to the Minister for Infrastructure and Planning. The application, under Part 2 of Schedule 3 of the Environmental Planning and Assessment Act 1979, seeks approval for a southerly extension of the existing Whitehaven Coal Mine. The Whitehaven Coal Mine commenced operations in September 2000 under a Development Consent (DA 72-03-2000) issued by the Minister for Planning.

As a consequence of improved economics and increasing demand, WCM has re-evaluated the remaining resource on its "Whitehaven" and "Womboola" properties within its existing mining leases. As a result of this re-evaluation, a further 2.4 Mt of coal has been assessed as amenable to open cut mining. The proposed extension area, referred to as "the Canyon" throughout this document, covers an area of approximately 50ha, 46ha of which would be subject to open cut mining.

Figure 1.1 positions the approved Whitehaven Coal Mine in its regional setting, approximately 30 kilometres north-west of Gunnedah and 16 kilometres east-south-east of Boggabri in the Gunnedah coalfields of NSW. **Figure 1.2** and **Plate 1** place the mine and its associated mining tenements (Mining Leases ML 1464 and 1471) in their local setting while **Figure 1.3** shows the status of mine development as of 01 October 2004. **Figure 1.3** also shows the areas of approved disturbance for mining and overburden emplacement over the remaining life of the mine, that likely to be disturbed and that associated with the proposed Canyon extension.

In addition to an extension of open cut mining activities, the application seeks approval for the relocation of some existing facilities to areas closer to the Canyon and for the segregation and stockpiling of suitable road-making gravels which have been identified as occurring within the footprint of the proposed open cut for future off-site utilization by WCM and others, eg Narrabri Shire Council.

Apart from presenting WCM's proposal for the Canyon extension, this document also provides relevant background information and provides a description of relevant aspects of the existing environment within and surrounding both the existing mine and the Canyon. The environmental safeguards and procedures that would be adopted to minimise or ameliorate the impacts associated with all proposed activities are outlined together with predicted impacts once those safeguards are adopted.

The information presented in this document covers all relevant aspects of the planning, development, operation, environmental monitoring and rehabilitation within the extension at a level of detail consistent with industry standards, the scale of the proposed operation and the potential environmental impacts.

Given that the extension of activities into the Canyon would represent a continuation of existing approved activities and, in general, the adoption of safeguards and procedures already proven to be effective at the existing mine, emphasis is initially placed upon a description of existing activities, environmental management procedures and performance, and impacts.

Table 1.1 presents a number of frequently used technical acronyms, abbreviations and symbols which have been used throughout this document.

	Terms		Symbols		
AEMR	Annual Environmental Management Report	bcm	Bank Cubic Metres		
СНРР	Coal Handling and Preparation Plant	km	Kilometre		
Council	Narrabri Shire Council	kV	Kilovolt		
DEC – EPA	Department of Environment and Conservation – Environment Protection Authority	L	Litre		
DEC – NPWS	Department of Environment and Conservation – National Parks and Wildlife Service	Lcm	Loose Cubic Metre		
DIPNR	Department of Infrastructure, Planning and Natural Resources	ML	Megalitre		
DPI – DMR	The Department of Primary Industries – Mineral Resources	М	Million		
EIS	Environmental Impact Statement	Mt	Million Tonnes		
EP&A Act 1979	Environmental Planning and Assessment Act	Mtpa	Million Tonnes Per Annum		
EP&A Regulation 2000	Environmental Planning and Assessment Regulation 2000	tpa	Tonnes Per Annum		
МОР	Mining Operations Plan	>	Greater Than		
ROM	Run-of-Mine	<	Less Than		
SoEE	Statement of Environmental Effects				
the Department	The Department of Infrastructure, Planning and Natural Resources				
the Minister	The Minister for Infrastructure, Planning and Natural Resources				
Vickery	Namoi Valley (Vickery) Coal Project				
WCM	Whitehaven Coal Mining Pty Ltd				

 Table 1.1

 Frequently Used Acronyms, Abbreviations and Symbols

1.1.2 The Application Area

The proposed Canyon Extension Application Area comprises:

- Lot 138 DP 754926 and Lot 2 DP 1038308, Parish of Boggabri;
- Lot 1 DP 1015797, Parish of Vickery;
- approximately 700m Shire Road or Road Reserve; and
- approximately 1.15 km Crown Road Reserve,

all within the County of Nandewar and Shire of Narrabri, and is consistent with the boundary of the DA area as identified in DA 72-03-2000.





WHITEHAVEN COAL MINING LIMITED

Proposed Canyon Extension





Figure Compiled by R.W. Corkery & Co.

WHITEHAVEN COAL MINING LIMITED Proposed Canyon Extension

\\SERVER\RWC\619\CAD\Canyon\619Base_1.3 Development.DWG

REFERENCE Mining Lease Boundary - ML 1471 Area of Approved Mine Development (not likely to be disturbed) Limit of Approved Open Cut Mining Proposed Canyon Extension Final Rehabilitation to Pasture Final Rehabilitation to Native Vegetation Rehabilitation Shaped not Soiled Cadastral Boundary Contour (m AHD) Existing Bank / Drain Drainage Direction Dam / Water Storage Vegetation Monitoring Location

	o Gunnedah
_,,,	

Figure 1.3 **EXISTING AND APPROVED** MINE DEVELOPMENT (as of 1/10/2004)

Although all proposed activities external to the existing areas of disturbance approved under DA 72-03-2000 would be confined to Lot 2 DP 1038308, an extended application area is considered appropriate to reflect the continued and/or proposed changed use of some areas or facilities within the limits of the previously approved disturbance for the existing Whitehaven Coal Mine.

1.1.3 Planning Context

1.1.3.1 Local Planning Instruments

The Whitehaven Coal Mine and the proposed Canyon extension lie within land zoned 1(a) General Rural under the Narrabri Local Environmental Plan 1992 (LEP 1992). Coal mining is a permissible land use within this zoning with development consent.

1.1.3.2 Regional Planning Issues

The Draft Regional Environmental Plan (REP) No 1 – Siding Spring is the only regional environmental plan currently applicable to the Whitehaven Coal Mine area. Both the existing mine and the proposed Canyon extension lie within a new region known as the Siding Spring Observatory Dark Skies Region which has been declared by the Minister for Infrastructure and Planning to better protect the observing conditions at the Siding Spring Observatory. Although the new region includes all local government areas falling within 200 km of the observatory, no consultation or concurrence is required with the Observatory Director for locations such as the Canyon extension which lie at distances greater than 100 km of the observatory: the Canyon extension lies at a distance of approximately 130 km from the Observatory.

Notwithstanding, the REP requires that the consent authority take into consideration the amount and type of light likely to be emitted by and from the development, and the probable effect of that emission on the level of artificial glow at the Observatory.

1.1.3.3 State Environmental Planning Policies

• State Environmental Planning Policy No. 11 (SEPP 11) "Traffic Generating Developments"

The proposed Canyon extension involves mining which is identified in Schedule 1 of SEPP 11. SEPP 11 requires that the NSW Roads and Traffic Authority (RTA) be:

- made aware of the proposed development; and
- given the opportunity to make representations on the proposed development.

The RTA was consulted during the preparation of the SoEE but no specific requirements were received.

It should be noted, however, that the proposed extension would not result in any increase in light or heavy vehicle movements on the local road network nor any change in the road network utilized by the mine. Nevertheless, a Traffic Impact Assessment has been provided in the Appendices.

• State Environmental Planning Policy No. 34 (SEPP 34) "Major Employment Generating Industrial Development"

Coal mining is classified as a major employment generating industrial development under Clause 7 of the policy. Accordingly, the Minister for Infrastructure and Planning as the consent authority, must ensure the aims of SEPP 34 are met. The aims of the policy include:

- to promote and co-ordinate the orderly and economic use and development of land and the economic welfare of the State;
- to facilitate certain types of major employment-generating industrial development of State significance;
- to facilitate the carrying out of labour intensive rural industrial development of State significance;
- to achieve appropriate planning controls in respect of such development; and
- to provide for public participation and involvement in the assessment of applications for consent to carry out such development.

• State Environmental Planning Policy No. 44 (SEPP 44) "Koala Habitat Protection"

The Narrabri Local Government Area is identified in Schedule 1 of this policy as an area that could provide habitat for Koalas. The policy requires an investigation be carried out to determine if core or potential Koala habitat is present and likely to be disturbed. Core Koala habitat comprises land with a resident population of Koalas whereas potential Koala habitat comprises land with native vegetation with known Koala feed trees constituting at least 15% of the total number of trees present on a site.

As Koala feed trees *Eucalyptus albens* (White Box) and *E. populnea ssp bimbil* (Bimbil Box), occur on or adjacent to the proposed Canyon extension, the area is classified as potential Koala habitat. However, based on the results of the fauna assessments undertaken by Countrywide Ecological Services (CES) over the 1999 to 2004 period and the absence of any resident population of Koalas, CES (2004) does not consider the area constitutes core Koala habitat.

SEPP 33 – Hazardous and Offensive Industry, was also assessed during the planning for the Canyon extension and the preparation of this application. SEPP 33 links the permissibility of a proposed industrial development to safety and environmental performance objectives and applies to any development proposals which are considered to constitute potentially hazardous or potentially offensive industries. Under Clause 3, a potentially hazardous industry is defined as a development that "would pose a significant risk in relation to the locality; to human health, life or property; or to the biophysical environment and includes a hazardous industry and a

hazardous storage establishment". A potentially offensive industry is defined as a development that "would have a significant adverse impact in the locality or on existing of likely future development on other land, and includes an offensive industry and offensive storage establishment".

Given that SEPP 33 was not deemed applicable to the existing Whitehaven Coal Mine and neither the existing mine nor extension pose a significant risk to human health, life or property or to the biophysical environment, SEPP 33 is not applicable to the proposed Canyon extension.

1.2 DOCUMENT FORMAT

This SoEE has been prepared in four sections with a set of Appendices and addresses those matters of relevance to the Application as identified in the Department's "EIS Guideline on Coal Mines and Associated Infrastructure", ie bearing in mind that the application pertains to an extension of existing approved activities.

The format of the Statement is as follows.

- Section 1. Introduces the proposal and the Proponent; reviews the background to the Application; identifies existing approvals, licences and leases; describes the various aspects of existing mining operations undertaken at the Whitehaven Coal Mine, the environmental management procedures adopted and environmental monitoring programmes and impacts. The section also addresses WCM's performance to date, consultation undertaken with community and government authorities with respect to this proposal, and ongoing documentation requirements over the life of the mine.
- Section 2. Describes WCM's objectives; the resource; the proposed mining sequence, method and activities within the Canyon extension; employment and infrastructure requirements; equipment; hours of operation; coal transportation; waste management and rehabilitation, with emphasis on those aspects which differ from those undertaken within the existing mine. The section also discusses the identified gravel resource and its extraction and management.
- Section 3. Describes the relevant components of the existing environment within and surrounding both the proposed Canyon extension and existing mine, and along the coal haulage route, presents the design and operations safeguards which are currently in place and will be continued or that will be implemented for activities in the Canyon extension area, and assesses the likely environmental effects.

Section 4. Presents a justification for the adoption of a Part 3, Schedule 2 assessment.

The descriptions presented in Sections 2 and 3 pertain primarily to the mine area, with discussion relating to activities at the Whitehaven Siding and CHPP provided for information purposes only: the EIS for the Whitehaven Siding CHPP addressed all matters relating to the preparation and despatch of 2 Mtpa coal and the facility is operated under development consent issued by Gunnedah Shire Council (DA 0079/2002) under delegation from the Minister for Planning.

1.3 THE APPLICANT

Whitehaven Coal Mining Limited (WCM) is an unlisted public company which was initially formed to explore and potentially develop the coal resource centred on the "Whitehaven" property. WCM's principal shareholders are directors and staff of AMCI Australia Pty Ltd (AMCI) owner of the Gunnedah Colliery located approximately 7 km south-west of Gunnedah and owner of the Glennies Creek Coal Mine north of Singleton. WCM also owns the Whitehaven Siding and CHPP approximately 6 km west of Gunnedah.

WCM and associated companies also hold a number of other tenements within the Gunnedah / Boggabri area which are subject to various forms of assessment activity including the "Belmont" Project 10 km east of the Whitehaven Coal Mine and the "East Boggabri" resource approximately 10 km north of the Whitehaven Coal Mine.

1.4 BACKGROUND

Coal mining in the Gunnedah basin commenced in the late 1890s with the opening of the Gunnedah and Centennial (later known as Preston) Collieries, both of which continued coal production throughout most of the 20th century producing high quality thermal coal and some soft coking coal for the domestic and export markets.

As a consequence of increasing mining costs and exhaustion of economic reserves, Preston Colliery closed in 1998. In mid 2000, mining also ceased at the Gunnedah Colliery for the same reasons.

The Vickery Coal Mine, located adjacent to the Whitehaven Coal Mine (**Figures 1.1** and **1.2** and **Plate 1**) was developed in the early 1990s but ceased operations in May 1998.

The Whitehaven Coal Mine has developed in two stages to date, commencing in January 2000. The first stage, a trial mine which commenced production in February 2000, was developed to supplement and maintain continuity of supply to the Gunnedah Colliery's domestic customers and enable domestic and export quality evaluation and an assessment of market acceptability of the coal. The Development Consent (DA 182/99) for the trial mine was issued by Narrabri Shire Council (NSC) on 19 November 1999 for a period of two years to allow achievement of the trial's objectives and, if nothing further was to have progressed, the rehabilitation of the site.

Based on the success of the trial mine, a development application for the Stage 2 (750000 tpa) mine (and an accompanying Environmental Impact Statement EIS) were lodged with the then Department of Urban Affairs and Planning (now DIPNR) in March 2000. The application, which extended upon and incorporated relevant aspects of the Stage I development, was approved in August 2000. Stage 2 mining commenced in September 2000 and has proceeded continuously since that time.

The 750,000 limit identified in the Stage 2 mine EIS was based on the foreseeable market for Whitehaven coal at the time, and represented an annual production rate approximately 50% greater than the expected annual average rate. However, as a consequence of greater than

Page 1 of 2

projected demand for coal from the mine, in February 2003 and application was lodged to modify DA 72-03-2000 to enable an increase in ROM coal production from 0.7 Mtpa to 1.25 Mtpa. The modification was approved in September 2003, with production since that time increasing to approximately 1.1 Mtpa.

A continuation of this greater than expected demand for Whitehaven coal by both domestic and overseas markets, increased demand for coal in general and the upward movement in coal prices subsequently precipitated a re-evaluation of the remaining coal resource on WCM's "Whitehaven" and "Womboola" properties within ML 1471. As a result of this re-evaluation, the economic overburden stripping ratio at the mine has been extended with a further 2.4 Mt of coal assessed as amenable to open cut mining, ie within the Canyon area on "Womboola".

1.5 EXISTING APPROVALS AND MINE STATUS

1.5.1 Existing Approvals, Licences and Tenements

Table 1.2 identifies the approvals, licences and tenements currently in place for the Whitehaven Coal Mine, the issuing / responsible authority, date of issue, duration (where limited) and relevant comments. The list is generally presented chronologically according to the date of issue.

Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
Department of Mineral Resources * ²	Exploration Licence (EL 4699)	1994 * ¹	26.09.2005	Last renewed 26.09.2000
Department of Mineral Resources * ²	Mining Lease (ML) 1464	21.12.1999	21.12.2020	ML 1464 covers the Stage 1 (trial) Mine area and lies wholly within the boundary ML1471
Environment Protection Authority * ³	Environment Protection Licence No. 10094	10.02.2000	Nil Anniversary date: 06 April Next review: 2006	Approval granted to commence Stage 1 operations. Final licence issued 06 April 2000 and subsequently amended 12 July 2001 by Notice of Variation to incorporate the Stage 2 operations. Scheduled Activities: Coal Mines, Coal Works, Crushing, Grinding or Separating Works to 2 Mtpa.
Minister for Urban Affairs and Planning * ⁴	Development Approval (DA) 72-03-2000	10.08.2000	07.09.2015	Approval for Stage 2 Mine. DA 72-03-2000 incorporated a requirement for the production and approval of a Mining Operations Plan, an Environmental Management Strategy and 14 separate management plans. (For approval / ratification details see Table 1.2).

Table 1.2Tenements, Licences and Approvals

				Page 2 of 2		
Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments		
Department of Land and Water	Water Licence 90BL249901	06.09.2000	Nil	Combined allocation of 100 MLpa.		
Conservation **	90BL252067	12.05.2004	Nil			
Department of Mineral Resources	ML1471	07.09.2000	07.09.2021	ML1471 surrounds ML1464		
Minister for Infrastructure and Planning	Modification MOD-8-2-2003-1	03.09.2003	07.09.2015	Approval granted permitting ROM coal production increase to 1.25 Mtpa and coarse reject disposal to the mine.		
 *¹ Originally issued to Namoi Valley Coal Pty Ltd and transferred to Whitehaven Coal Mining Pty Ltd 01.10.99 *² Now Department of Primary Industries (DPI) 						

Table 1.2 (Cont'd) **Tenements, Licences and Approvals**

partment of Primary Industries (DPI)

*3 Now, Department of Environment and Conservation (DEC)

*4 Now, Minister for Infrastructure and Planning. Responsible department, Department of Infrastructure, Planning and Natural Resources (DIPNR)

In addition to the above, WCM has also received approval from the DEC (by virtue of Condition 6.4.2(e) of DA 72-03-2000) to undertake coal transportation activities to 10.00 pm Monday to Saturday (an extension from the 9.30 pm specified in Condition 6.4.2(f)) and limited coal mining activities on a two shift operation to approximately 2.00 am.

Reviews of compliance / performance with the conditions identified in DA 72-03-2000 (as modified), Environment Protection Licence 10094 and MLs 1464 and 1471, are presented in Appendix 1, Tables A1-1, A1-2 and A1-3 respectively.

As noted in **Table 1.2**, DA 72-03-2000 required the preparation of a Mining Operations Plan (to the satisfaction of DMR), and an Environmental Management Strategy and 14 separate management plans (for the approval of the Minister for Urban Affairs and Planning), while Condition 3.2(f), an additional condition imposed through MOD 8-2-2003-1, included a requirement to update the environmental management plans identified in Condition 3.2(d), prior to a production increase beyond 750000 tpa. Subsequent advice from DIPNR limited the plans requiring updating to the Site Water Management Plan and the Road Noise Management Plan. **Table 1.3** lists the various plans, the approval / ratification details, and salient comments.

Title	Submitted To	Initial Approval (Ratification) Date	Comment		
Mining Operations Plan (MLs 1464 and 1471)	DMR	(12.10.00)	Most recent MOP ratified 25.03.03		
Environmental Management Strategy	DUAP	13.08.00 1.			
Archaeology and Cultural Management Plan	DUAP	13.08.00 1.			
Flora and Fauna Management Plan	DUAP	13.08.00	Revised plan submitted 27.09.02 and approved 29.10.02 ^{2.}		
Erosion and Sediment Control Plan	DUAP	13.08.00 1.			
Soil Stripping Management Plan	DMR, DLWC	05.11.00; 11.09.00 ⁻³ .	Revised plan approved 31/07/03 DIPNR - DEC (DLWC); 04/08/03 DPI (DMR)		
Landscape Management Plan	DMR, DLWC	13.08.00 3.			
Bushfire Management Plan	NSC, GSC	05.09.00 4.			
Land Management Plan	NSC, GSC	13.08.02	Revised plan submitted 21.10.02 and approved 08.11.02 ^{5.}		
Site Water Management Plan	DUAP	13.08.00 1.	Updated Plan approved 30.03.04		
Dust Management Plan	DUAP	13.08.00 1.			
Blast / Vibration Management Plan	DUAP	13.08.00 1.			
Noise Management Plan	DUAP	13.08.00 1.			
Construction Noise Management Plan	DUAP	13.08.00 1.			
Road Noise Management Plan	DUAP	20.09.00 ⁶ .	Updated Plan approved 30.03.04		
Heavy Vehicle Rail Crossing Risk Assessment Management Plan	DUAP	20.09.00 ⁶ .			
 * Notes: ^{1.} Revision / update required no later than 13.08.05 ^{2.} Further revision / update required no later than 29.10.07 ^{3.} Revision / update required no later than 11.09.05 ^{4.} Revision / update required no later than 05.09.05 ^{5.} Further revision / update required no later than 08.11.07 ^{6.} Revision / update required no later than 20.09.05 DUAP - now DIPNR DMR - now DIPNR DLWC - now DIPNR 					

Table 1.3 Management Plans

1.5.2 Mine Status

Figure 1.3 and Plate 1 show the existing status of the Whitehaven Coal Mine together with those areas to be disturbed by mining and associated activities over the remaining life of the mine.

Table 1.4 identifies the areas of disturbance associated with the open cut, out-of-pit overburden dumps and infrastructure as of 01 October 2004; the areas approved or to be developed for each of the above activities and the areas approved but no longer required.

Aspect	1. Existing Disturbance	2. Approved (yet to be developed)	3. Total Approved for Disturbance (1 + 2)	4. Still to be Disturbed	5. Total Disturbed (1 + 4)	6. Approved but not to be Disturbed
Open Cut	69.0	19.0	88.0	15.1	86.1	1.9
Out-of-Pit Dumps	24.0	5.5	29.5	Nil	24.0	5.5
Infrastructure , ie roads, buildings etc	10.5	13.2	23.7	Nil	10.5	13.2
TOTAL	103.5	37.7	141.2	15.1	120.6	20.6

 Table 1.4

 Existing and Approved Areas of Disturbance

Although the existing approval allows for the disturbance of a further 18.7 ha for infrastructure and out-of-pit overburden dumps, refined mine infrastructure planning and improved overburden management has eliminated this requirement. The reduction in the open cut area by 1.9 ha is a result of a localized steep dips in the coal seam and an uneconomic stripping ratio. This reduction is additional to a prior reduction in disturbance for overburden emplacements of 6.2 ha as identified in MOD 8-2-2003-1.

1.6 EXISTING ACTIVITIES

1.6.1 Introduction

The following sub-sections describe the existing approved activities undertaken at or in association with the Whitehaven Coal Mine; mining equipment, infrastructure and hours of operation; waste and safety management; employment; on-site processing; coal transportation on and off-site; and environmental management procedures, monitoring programmes, impacts and performance to date.

1.6.2 Mining

1.6.2.1 Sequence

Coal mining at the existing approved Whitehaven Coal Mine employs a conventional haulback system which involves up to ten sequential activities, namely:

- (i) drainage installation;
- (ii) vegetation removal;
- (iii) soil stripping;
- (iv) overburden drilling and blasting;
- (v) overburden removal from above the uppermost ply of the coal seam;
- (vi) upper coal ply excavation;
- (vii) interburden excavation and removal;
- (viii) lower coal ply excavation;
- (ix) final landform shaping and preparation;
- (x) final landform revegetation.

The above activities, each of which is generally being undertaken concurrently in various areas of the mine, are described in the following sub-sections.

To facilitate the sequential development of the mine, the area of approved Stage 2 mining has been sub-divided into 33 north-east / south-west 50m wide open cut strips, each generally comprising three to four 130m to 200m long blocks (**Figure 1.4**). Each block may, in turn, be sub-divided to suit individual blast requirements.

(i) Drainage Installation

Prior to any disturbance, a network of storage dams, sediment basins and banks / drains is installed to:

- divert and/or collect "clean" water; and
- collect "dirty" water which would potentially be generated off mine-disturbed areas and detain it for sufficient time that it may be of a quality suitable for discharge off the mine-site or for transfer to the clean water management system.

Figure 1.3 shows the major components of existing "clean" and "dirty" water management system in place at the Whitehaven Coal Mine to comprise 13 sediment basins (prefix SD-) and six storage dams (prefix SB-) with interlinking banks / drains which effectively encapsulate all flows from existing and approved areas of disturbance. The combined storage of all structures approximates 87 ML (38 ML in sediment basins and 49 ML in storage dams). **Figure 1.3** also shows the contour banks installed on areas of the rehabilitated final landform. Overland flows collected by the contour banks are directed to the natural surface and the sediment basin / storage dam system via rock waterways.

All sediment basins, storage dams and associated banks and drains, contour banks and rock waterways have been designed and constructed by Department of Lands (Soil Services) personnel. Maintenance of these structures, other than routine accumulated sediment removal from sediment basins, is also generally undertaken by Soil Services.

(ii) Vegetation Removal

Vegetation removal in areas of mine-related disturbance may take two forms.

- (a) Incorporation with the topsoil (in areas of native or improved pasture and/or former cropping land).
- (b) Chainsaw felling and/or dozer pushing of trees in woodland areas. All trees removed are cut/broken into manageable pieces where necessary, suitable timber removed for agricultural purposes, eg fencing, and the remainder (other than stumps) placed on the previously-topsoiled and seeded surfaces of the post-mining landform identified as to be returned to a native vegetation community. Tree stumps are buried within the open cut. **Plate 2** shows previously-felled trees placed on areas of the post-mining landform.



Plate 2: Fourteen month old vegetation showing replaced trees from clearing activities. (Ref. No. DSC 00771.jpg)



During the initial two years of mining operations, ie while on the "Whitehaven" property (**Figure 1.3**), vegetation removal was of form (a), with a combination of forms (a) and (b) utilized since that time, ie as the mine progressed into WCM's "Womboola" property.

Removal of vegetation is undertaken on a campaign basis, with removal of form (a) undertaken on an as-needs basis, generally 80m in advance of mine development. Removal of trees in woodland areas, ie form (b), is undertaken annually (in late summer or early autumn) following a pre-clearing inspection undertaken by WCM's consultant ecologist. The pre-clearing inspections, undertaken in accordance with commitments in the approved Flora and Fauna Management Plan (see **Table 1.3**), are designed to ascertain if Threatened species are present and require relocation. No Threatened species relocation has been required to date.

(iii) Soil Stripping

Soil stripping involves the separate removal of topsoil and subsoil layers (by scraper) in accordance with a soil stripping plan prepared using information derived from detailed soils investigations undertaken during the preparation of the Stage 2 EIS. Topsoil stripping is undertaken in the presence of monitors from the Red Chief Local Aboriginal Land Council.

The topsoil and subsoil are either placed directly onto previously-shaped areas of the postmining landform or are placed in stockpiles for use in subsequent rehabilitation activities.

Following the removal of the subsoil, the underlying friable overburden layer is also removed for use as a cover over the replaced overburden.

Topsoil, subsoil and friable overburden from areas currently carrying a native vegetation cover are kept separate from those from exotic pasture areas so that, wherever practicable, soil from pasture areas is used in areas to be rehabilitated to pasture and that from native vegetation areas is used in areas to be rehabilitated to native vegetation. All soil stockpiles are positioned within existing cleared areas.

Over the period to 01 October 2004, approximately 414000 m³ topsoil and subsoil and 245000 m³ friable overburden had been stripped from areas of mine-related disturbance. Of the volumes stripped, approximately 232000 m³ topsoil and subsoil and 65000 m³ friable overburden has been replaced on the post-mining landform, with the remaining 362000 m³ topsoil, subsoil and friable overburden retained in stockpiles for future rehabilitation purposes. **Figure 1.3** and **Plate 1** show the existing stockpiles.

Surveyed reconciliations of the individual stockpiles are maintained.

(iv) Competent overburden drilling and blasting

Following the removal of the topsoil, subsoil and friable overburden, the competent overburden (conglomerate, sandstone, shale, mudstone) is drilled and blasted. Blasting is currently undertaken approximately fortnightly, with each blast initiated over an area of 50m x 100-140m to generate approximately 200000m³ to 260000m³ overburden and expose approximately 43500t coal.

Throwblasting, combined with the use of narrow (50m wide) mine blocks, results in approximately 20 per cent of overburden generated from each blast being cast into the adjacent mined-out area.

All blasts are designed by blasting engineers and monitored, with specific procedures employed in areas of adverse geological conditions which could potentially result in airblast and vibration exceedances. The explosives used in each blast may comprise one or a mixture of Softload, Anfo or Aquamax, depending on the occurrences of water within the drill holes. Blasthole stemming is provided by imported aggregate.

As of 01 October, a total of 117 blasts had been initiated at the mine since the commencement of operations.

The outcomes of the blast monitoring programme are discussed in Section 1.7.5.3.

(v) **Overburden removal**

Blasted overburden not cast into mined-out areas and overlying areas of coal, ie approximately 80% of the overburden yielded from each blast, is removed by a combination of dozer pushing (25%) and excavator loading and hauling using dump trucks (75%).

Dozer pushing is initially used following the blast to push the overburden into adjacent recently mined-out areas of the open cut, with the excavator(s) and dump trucks then used to remove the remaining overburden from, and expose, the upper ply of the coal seam. The overburden is placed as and from a series of benches which are subsequently pushed by bulldozers to ultimately create the post-mining landform (**Plates 1** and **3**).

During the initial stage of the mine's development, the overburden was placed within an out-ofpit dump to the north-west of the open cut limit, with subsequent overburden disposal principally within and over the mined-out areas.

DA 72-03-2000 allows for the construction of three out-of-pit dumps: the northern, western and southern dumps, of which only the northern dump and approximately 40% of the western dump area has been utilized (**Figure 1.3**). Based on current mine planning, neither the remaining area of the western dump nor the southern dump is likely to be required.

(vi) Upper coal ply excavation

Once all overburden is removed from the coal seam in each blast area, the upper (WAG) coal ply is removed by excavator (generally without ripping) to expose the underlying interburden, loaded into dump trucks and transported to the ROM stockpile area at the on-site processing plant. On-site processing is described in Section 1.6.4.



Plate 3: An oblique aerial photograph showing benched overburden / interburden disposal areas. (Ref. No. whitehavennov04 003.jpg)

(vii) Interburden excavation and removal

Within the existing approved mine area, an interburden layer varying from 0.2m to 1.0m in thickness lies between the WAG and the underlying WAF to WAC coal plies. Following ripping by bulldozer, the interburden is removed by excavator to expose the roof of the WAF ply.

The interburden is loaded into haul trucks and emplaced into and over the former open cut in the same manner as the overburden (see (v) above).

(viii) Lower coal ply excavation

The coal underlying the interburden between the WAG and WAF plies comprises up to four coal plies which have coalesced or are separated by interburden layers generally less than 0.3m in thickness. Except where interburden layers exceed 0.3m, these plies are essentially excavated en masse and transported by haul truck to the ROM stockpile area at the on-site processing plant.

The WAC ply is underlain by two additional thin coal plies (the WAB and WAA plies), with interburden layers between each of these plies ranging up to 4m in thickness but decreasing in thickness to the south, ie within the Canyon area. Due to their poorer quality and thickness (approximately 0.5 m) and the thickness of the WAC to WAB interburden within the majority of the areas mined to date (generally greater than 2m), extraction of these plies has not been undertaken until recently, and then, only in the south-western area of the open cut. In these areas, the WAC to WAB interburden thickness has reduced to about 0.3m, resulting essentially in a single coal seam exposure of 5m to 6m.

The Development Consent for the Whitehaven Coal Mine also permits the extraction of coal from the highwall, ie by highwall / auger mining techniques. However, no extraction by these methods has as yet been undertaken or feasible.

(ix) Final landform shaping and preparation

Once the planned volume of overburden is placed into and over any area of the former open cut, landform shaping is undertaken by bulldozer to create an undulating landform with slopes of 1:5 (V:H) or less. The friable overburden, subsoil and topsoil are then replaced to pre-determined thicknesses and post-mining drainage designed and installed by Department of Lands (Soil Services). Figure 1.3 and Plates 1 and 3 show the areas shaped to their final form as of 01 October 2004.

The replacement thicknesses for each of the friable overburden, subsoil and topsoil are determined by the mine's surveyor based on the area and nature of existing and planned disturbance, existing topsoil, subsoil and friable overburden stockpile volumes; the volumes of each material projected for stripping based on the Soil Management Plan, WCM's obligations with respect to post-mining native vegetation establishment, and its desire to only utilize topsoil from areas cleared of native vegetation on areas assigned for native vegetation re-establishment.

Other areas of disturbance will also be progressively rehabilitated once they are no longer required for operational purposes, with the nature of rehabilitation activities required and undertaken determined by the form of disturbance. For example, rehabilitation of hardstand or coal stockpile areas such as those previously located to the north of the existing office and administration area would generally only involve removal of foreign materials, ripping and subsoil and/or topsoil application.

(x) Final landform revegetation

Final landform revegetation at the existing Whitehaven Coal Mine involves the establishment of areas of pasture and areas where the post-mining vegetation communities are designed to ultimately emulate the native communities currently or formerly present on WCM's "Womboola" property, with Condition 3.4(b) of DA 72-03-2000 requiring the establishment of 2ha native bushland for each one hectare cleared.

The methods adopted for both the pasture and native bushland areas are detailed in the approved Revised Flora and Fauna Management Plan (October 2002), which was prepared in consultation with the DEC (NPWS), and are summarized below.

WCM's existing performance with respect to final landform revegetation is discussed in Section 1.7.8.

Pasture Areas

For pasture areas, the previously topsoiled surface is sown with a mixture of pasture species appropriate for the season such as Phalaris; sub-clovers; Haifa White Clover; Rye Grass; Lucerne and Serradella at an application rate of 25 kg/ha, with double super phosphate initially applied at 100 kg/ha. The seed is generally broadcast with pasture harrows used to provide seed coverage.

Tree lots may ultimately be established within the pasture areas to provide future stock shelter.

• Native Bushland Areas

Final landform revegetation to areas assigned for native bushland establishment is primarily reliant on the transfer of propagules within the topsoil being moved directly from areas being stripped in advance of mine development, with application of a seasonally appropriate non-persistent cover crop such as wheat or Japanese Millet used to impart early and rapid surface stability and provide an additional mulch to the surface. Application of a mulch of mature native grass culms and seed heads harvested from open grassland areas on "Womboola" has also been trialled and proven to be successful in the establishment of native grass species.

Seedling mixes of tree and shrub species propagated from locally collected seed are then planted on rip-lines at nominal 5m x 5m centres as recommended by WCM's consultant botanist. 5m x 5m nominal centres (or 400 trees / ha) allows for some natural attrition over time and will result in a variability in stem density which occurs naturally in undisturbed areas. Planting at a higher density, though allowing for greater attrition rates, was not recommended due to the increased competition and stress on the seedlings / young trees, and its tendency to impede natural groundcover species development. The seedling mix composition has been determined by the position on the landform, eg upper, mid and lower slopes, in order to emulate the similar natural variations in community composition with topography.

Subject to the results of future native revegetation monitoring programmes (see Section 1.7.7) oversowing of the tree, shrub and grass species collected from within the bushland areas may also be undertaken.

To date, a total of 620 seedlings comprising White Box, Yellow Box, Silver-leaf Ironbark and Narrow-leaf Ironbark have been planted. Seed of other species planned for planting has been unavailable on WCM's landholding to-date due to drought-induced stress on the native vegetation and poor to nil flowering and seed set.

1.6.3 Equipment

Table 1.5 identifies the principal items of mining equipment currently in use at the Whitehaven Coal Mine, the number routinely in use and their primary function(s). Approved hours of operation for the various activities and items of equipment, and their current duration of use, are presented in Section 1.6.6.

ITEM	NUMBER IN OPERATION	FUNCTION				
Hitachi 3600 Excavator (new)	1	Overburden excavation and loading				
Komatsu PC 1250	1	Overburden / interburden / coal loading				
CAT 785	$2 *^1$	Overburden haulage				
CAT 777	$2 *^1$	Interburden / coal haulage				
Carry Dozer (D11)	1	Overburden pushing				
Dozer (D11)	1	Overburden pushing				
Dozer (D10)	1	Clearing; interburden / coal ripping / pushing; dump maintenance				
Grader (14G)	1	Road maintenance				
Drill Rig (Ingersoll Rand DM45)	1	Blasthole drilling				
Scraper	$2 *^2$	Soil removal and replacement				
Water Truck	1	Dust suppression				
Crushing Plant	1	Coal size reduction				
FEL (988G)	1	Feeding crushing plant				
Lighting Towers	2-5	Light for evening / night operation				
Fuel / Service Truck	1	Equipment refuelling / servicing				
Forklift / Tyre Handler	1	Equipment handling				
$ \begin{array}{c} *^1 \\ *^2 \end{array} \begin{array}{c} \text{Three on site; one routinel} \\ 1 \text{ off Cat } 627; 1 \text{ off } 637 \end{array} $	y on standby					

Table 1.5Mining Equipment

1.6.4 Processing

All coal extracted from the Whitehaven Coal Mine is assessed in pit and, depending the ply, know quality and the extent of dilution with overburden and interburden materials, is classified into:

- "clean" top seam;
- "clean" bottom seam;
- "dirty"; and
- "dirty-dirty".

The classification determines the form of subsequent processing undertaken on-site and off-site.

On-site processing is limited to crushing to <200mm using a 600 tph breaker-feeder located as shown on **Figure 1.3**, with the coal from the breaker conveyed to a 150t capacity overhead bin. The coal is then loaded from the bin and transported to the Whitehaven Siding CHPP for size reduction to <50mm prior to washing ("dirty" and "dirty-dirty" coal) and/or stockpiling to await despatch.

Over the life of the mine to date, approximately 70 per cent of coal has required washing to achieve specific customer requirements.

1.6.5 Waste Management

Wastes produced directly or indirectly at / from the Whitehaven Coal Mine comprise:

- general domestic type wastes from on-site buildings and routine maintenance consumables;
- oils and grease;
- sewage;
- overburden and interburden; and
- coarse and fine coal preparation plant rejects from any coal washing undertaken.

Management of each of the above wastes is undertaken as follows and, in each case, is consistent with the methods approved by DA 72-03-2000, DA 72-03-2000 Mod 1 or DA 0079 / 2002. The management of coarse and fine coal rejects from the Whitehaven CHPP in the manner described is also approved under S.126, Coal Mines Regulation Act (CMRA) 1982.

Domestic Type Wastes

All general wastes are collected on-site and placed into large storage receptacles on a daily basis. An industrial waste contractor collects this waste, along with industrial wastes, approximately fortnightly.

Oil Containment and Disposal

Waste oils and grease from the maintenance building are pumped from the machinery to bulk storage tanks bunded in accordance with EPA requirements. When breakdown maintenance is undertaken away from the maintenance building, oil and grease is pumped from the equipment to a tank on the service truck from which it is subsequently transferred to the bulk storage tank.

Waste oil and grease stored within the bulk storage tanks is collected and disposed of by a licensed contractor approximately once every three months.

Runoff from the concrete vehicle and equipment wash pad and maintenance and fuel farm areas is directed to an oil separator and containment system for subsequent pump-out and disposal.

Sewage Treatment and Disposal

Effluent from the sewage and ablutions facilities at the Whitehaven Coal Mine is managed through a Council-approved septic system. The septic system is pumped out by a licensed waste disposal contractor on an as-needs-basis, historically twice per annum.

Overburden and Interburden

Overburden and interburden materials are either placed into and over the footprint of the open cut or in out-of-pit dumps in the manner described in Sections 1.6.2.1 (v) and (vii).

Preparation Plant Rejects

Washing of coal (undertaken off-site) generates two forms of reject: a coarse reject (nominal particle size: 1.5 mm to 50 mm) and a fine reject (nominal particle size: near zero to 1.5 mm) and for the Whitehaven coal, constitute approximately 10% and 7% of coal preparation plant throughput. Both coarse and fine rejects comprise a mixture of coal and non-coal materials, eg sedimentary rocks such as shale, mudstone or claystone, and sands, silts and clays, which either occur naturally within the coal seam or represent overburden or interburden materials which dilute the coal during its extraction. Chemical analyses of the rejects have shown the materials to be benign and analyses of the leachate emanating from the fine reject ponds at the Whitehaven CHPP have shown it to be of a quality which satisfies drinking (health), livestock and irrigation purposes.

The coarse and fine rejects generated in the coal washing process are managed as follows.

- Coarse reject backloaded to the Whitehaven Coal Mine using the product coal trucks where it is placed in approved (S.126 CMRA 1982) emplacement areas within the former mine void, ie below ground level.
- Fine reject pumped to a series of fine reject ponds within the Whitehaven balloon rail loop for consolidation. Following consolidation, the fine rejects are excavated and either blended with "clean" coal to satisfy higher ash market requirements or are transported to the North Cut Melville underground void at the Gunnedah Colliery for use in final landform development.

1.6.6 Hours of Operation

Table 1.6 identifies the approved hours of operation for the Whitehaven Coal Mine and those currently worked on a routine basis.

Although some site work is undertaken on Saturdays, most activities are generally undertaken on an irregular basis and/or at a reduced scale. Coal haulage on Saturdays, though occurring more frequently, is also on a reduce scale and generally ceases by 3.00 pm.

A review of **Table 1.6** shows that although WCM has approval to undertaken limited mining activities from 2200 hours through to approximately 0200 hours, use of these hours has yet to be initiated, with the majority of mining activities ceasing by 1800 hours each day.

Mining, processing and maintenance activities undertaken after dusk are illuminated using a combination of seven mobile lighting towers and five fixed lights. All lights are hooded to project the light downwards and/or onto the work area only and are positioned to prevent any glare projecting towards neighbouring residences or the local road network. No lighting-related complaints have been received over the life of the mine to-date.

Activity		Approved	Currently Worked		
Activity	Normal	Contingency	Days	Hours	Days
Open Cut Mining					
Clearing / Soil Removal	0700 - 2200		Monday to Friday	0800 - 1700	5 days/week *1
		0700 - 2200	Saturday		
Drilling	0700 - 2200		Monday to Friday	0700 - 1730	Monday to Friday
		0700 - 2200	Saturday	0700 - 1500	
Blasting	0900 - 1700		Monday to Friday *2	1000 - 1700	Once per fortnight
		0900 - 1700	Saturday *2		
Overburden Removal and Replacement	0700 - 0200 * ³		Monday to Friday	0700 - 2200 *4	Monday to Friday
		0700 - 2200	Saturday		
Coal extraction and internal coal transport to the on-site processing plant	0700 - 2200		Monday to Friday	0700 - 1800	3-4 days/week
		0700 - 2200	Saturday		
Rehabilitation	0700 - 2200		Monday to Friday	0700 - 1800	5 days/week
		0700 - 2200	Saturday		
Highwall Mining * ⁵					
Coal production / stockpiling	24 hrs/day *6		7 days/week	Nil	Nil
Coal loading/internal haulage to processing plant	0700 - 2200		Monday to Saturday	Nil	Nil
On Site Processing	0700 - 2200		Monday to Friday	0700 - 1930	Monday to Friday
		0700 - 2200	Saturday		
Maintenance	0700 - 2200		Monday to Saturday	0700 - 2000	Monday to Friday
		24 hours/day	7 days/week	2200 - 0200	Monday to Friday
Product Coal Loading and Despatch	0700 - 2200		Monday to Saturday $*^7$	0700 - 2200 0700 - 1500	Monday to Friday Saturday

Table 1.6 Hours of Operation

*¹ Undertaken in conjunction with rehabilitation.

 $*^2$ Blasting to be confined to 1000 to 1700 hours and generally between 1100 and 1200 or around 1400 hours.

*³ Below natural surface after 2200 hours.

*⁴ Truck haulage to 1800 hours; dozer push to 2200 hours.

*⁵ By highwall or auger mining techniques.

*⁶ Auger production would generally be undertaken between 0700 and 2200 hours.

*⁷ No haulage on Public Holidays; last coal loaded 2130 hours.

1.6.7 Transportation

On-site transportation of overburden and interburden to the waste dumps, and of coal to the processing plant, is by haul truck (Cat 785 and Cat 777) utilizing a series of temporary haulroads and ramps which are progressively advanced with the progression of the active mine face. Cat 785 and 777 haul trucks carry payloads of approximately 160t and 85t respectively. The haulroads are typically 25m to 30m wide, ie in excess of three times the width of the Cat 785 truck, the largest haulage vehicle on the site, constructed of overburden and are routinely maintained by the grader and water truck.

Transportation of coal from the mine to the Whitehaven Siding CHPP is undertaken by a contracted haulage company, Howard Haulage Pty Ltd, primarily using semi-trailers with a capacity of 30t and using the roads identified in DA 72-03-2000 and DA 0079/2002 and shown on **Figure 1.5**, namely:

- (a) the sealed private mine access road;
- (b) Hoads Lane;
- (c) Blue Vale Road;
- (d) Kamilaroi Highway; and
- (e) Siding Access Road.

Hoads Lane, the Hoads Lane / Blue Vale Road intersection; the Quia Road / Kamilaroi Highway intersection and Quia Road have all been upgraded in accordance with Conditions 7.3(e) of Development Consent 72-03-2000.

At the current production rate of approximately 1.1 Mtpa coal, an average of 140 truck loads of coal are despatched daily, 5.5 days per week, using 8 to 10 trucks. 140 truck loads equate to 280 truck movements per day or approximately 19 truck movements per hour. A maximum of 24 truck movements would occur in any one hour. An average of 14 truck loads of coarse reject are returned to the mine daily as backloads in what would otherwise be empty trucks.

WCM has an established Transport Policy and Code of Conduct which applies to all vehicles travelling to and from the mine but, in particular, to coal transportation vehicles. The Policy and Code identifies expected behaviour relating to aspects such as travelling speeds, periods of concurrent coal haulage and school bus movements on Hoads Lane, complaints handling and disciplinary procedures and the consequences of a failure to comply.

During the initial six months of the mine's operations, there were a number of complaints from the public regarding aspects which were in part attributable to coal haulage (see Section 1.7.12). However, in the majority of instances, the complaints related to dust and visibility effects from trucks moving on Hoads Lane (prior to its sealing) and noise at residences adjacent to Quia Road (prior to its upgrading). Since the widening and sealing of Hoads Lane and the hot mixing of Hoads Lane, complaints regarding coal transportation activities have been negligible, with three complaints only (one relating to a failure to stop at a "Stop" sign, one relating to a failure to observe and give way to local traffic at the Mine Access Road / Hoads Lane intersection and the other relating to coal trucks moving to the wrong side of the road (to avoid areas of pavement damage) reported since 30 September 2001.



Mr G Lee, operator of the school bus which travels along Blue Vale Road and Hoads Lane, reports that coal truck driver behaviour is good in the main with isolated instances only of fine coal blowing from trucks as a consequence of inadequate load coverage. This issue has been addressed with the haulage contractor, with roll-over tarpaulins now installed on more than 70% of the Howard Haulage fleet, and being progressively installed on the remaining trucks.

An average of approximately 44 mine-related light vehicle movements and two equipment, services and supplies deliveries occur daily, with the majority of light vehicle movements concentrated between 6.00 am and 7.00 am and 6.00 pm and 7.00 pm, ie at the beginning and end of each day shift. Equipment, services and supplies deliveries tend generally to occur around midday.

Maintenance of the Hoads Lane, Blue Vale Road, Quia Road and Torrens Road components of the coal transportation route is undertaken in accordance with agreements between WCM and each of Narrabri and Gunnedah Shire Councils.

All coal destined for the export market is transported by train to the Port Waratah or Kooragang Island ship loaders at the Port of Newcastle. Domestic coal is currently despatched from the Whitehaven Siding by the public road network.

1.6.8 Employment

An average of 52 full-time personnel are currently employed at the Whitehaven Coal Mine or in the transportation of coal to and from the mine, with a further 12 full-time persons involved in coal preparation and despatch activities at the Whitehaven Siding CHPP and train loader. The 52 mine-related employees comprise:

- 30 employed by Roche Mining, WCM's mining contractor;
- 2 employed by WCM; and
- 20 employed by Howard Haulage Pty Ltd, WCM's coal haulage contractor.

An average of three persons are employed at the mine on a casual basis, primarily associated with blasting.

All permanent employees are resident in the Gunnedah / Boggabri area, with approximately 65% of current Roche employees, 100% of WCM employees and 90% of Howard Haulage employees resident in the local area prior to the commencement of the mine.

1.6.9 Infrastructure and Services

The following infrastructure and services are currently provided to the Whitehaven Coal Mine.

Infrastructure

• Temporary ATCO type transportable buildings within the Mine Facilities Area (**Figure 1.3**). These buildings, which comprise offices, a crib room, first aid room and toilets, are positioned on brick/concrete pier foundations and fixed to concrete anchors to prevent movement in strong winds.

- A workshop building and a bunded fuel / oil storage. The bunded storage, which contains two 50 000 L diesel storage tanks, waste and unused oils, has a capacity to hold 240 000 L.
- A potable water tank.
- Handstand areas for light and heavy vehicle parking.
- A meteorological station.
- Various (shipping) containers.
- Two licenced magazines for overnight storage of boosters and detonators.
- A crushing plant. The crushing plant and associated ROM coal stockpiles are located on the surface of a formerly mined and backfilled area of the open cut.
- A 150 t coal bin. The coal bin, which enables direct loading of coal trucks, is positioned on the natural surface immediately to the north-east of the crushing plant.

Reticulated Services

• Telephone and fax (by buried land line).

Supplementary Services

- Power by enclosed generators.
- UHF radio for contact between the mines office, mobile equipment and the WCM office at the Whitehaven CHPP.
- Potable / ablutions water delivered by water truck from Gunnedah or Boggabri (approximately 1.4 ML pa).
- Dust suppression water from a combination of on-site water harvesting, groundwater extraction, and groundwater inflows and incident rainfall to the open cut excavation. Annual dust suppression water usage during the four years since the approval of DA 72-03-2000 has approximated 67 ML, 48 ML, 75 ML and 65 ML respectively, of which all but 9 ML in 2002 / 2003 was sourced on site. Due to the drought conditions which were prevailing in late 2002 / early 2003 and the lack of water within on-site storages, approximately 9 ML water was hauled to the mine by water tanker for dust suppression purposes. Haulage of water was undertaken in preference to depleting storages on adjacent properties constructed by WCM (albeit permissible under the agreements with the landowners).

Despite the continuation of drought conditions since that time, a combination of infrequent high intensity rainfall events and water collected within the open cut have enabled the mine to be self sufficient with respect to dust-suppression water requirements.

• Sewage – by septic system with a capacity adequate for the site-based workforce.

1.6.10 Hazardous Materials

With the exception of two small magazines for the temporary (overnight) storage of boosters and detonators (**Figure 1.3**), no materials are retained on the mine in sufficient quantity to require licensing by WorkCover. Nitropril (in bulka bags) may be retained on site within the Nitropril Storage Area (**Figure 1.3**). However, mixing of the Nitropril with distillate to produce an explosive is undertaken on the day of each blast using a purpose built mixer and in a quantity adequate only for that particular blast.

The magazines, licensed by WorkCover (No 35/036461), were installed to avoid any potential requirement the overnight storage of boosters / detonators in vehicles when blast loading operations were undertaken over more than one day. No explosives are retained within the magazines between blasts, with any excess removed from the mine by the blasting contractor following each blast.

Materials Safety Data Sheets are retained on site for all potentially hazardous materials, independent of their quantity.

1.6.11 Safety / Security Management

The Whitehaven Coal Mine is well positioned with respect to security and safety aspects, being isolated from population centres, positioned in excess of 1 km from any public road and readily accessible only by a single access road which is locked when no mine-related personnel are at the mine.

Central to all aspects of site security and safety are:

- adoption of a pro-active approach to public and employee safety;
- strict compliance with the requirements of all relevant legislation, eg Coal Mines Regulation Act 1982, Coal Mines (Open Cut) Regulation 1999, Coal Mines (General) Regulation 1999, Occupational Health and Safety Act 2000;
- an Occupation Health and Safety Policy; and
- Transport Policy and Code of Conduct.

Specific safety and security measures implemented in satisfaction of the above include, but are not limited to:

- fencing to isolate areas of activity at the mine from adjacent properties and areas of agricultural activity on WCM's landholding;
- strategic placement of security / warning signs around and within WCM's leases indicating the presence of earthmoving and mining equipment, deep excavation, steep slopes and providing advance notification of blasts. Signs are also installed to restrict access to areas during particular activities such as loading blast holes.
- employee inductions in safe working practices and regular follow-up toolbox talks and safety reviews;

- bunding along the margins of internal roads where these roads are adjacent to steep slopes or excavations;
- maintenance of all plant and equipment to ensure compliance with Section 103 CMRA, 1982 and MDG.15;
- ensuring roadworthiness of all trucks hauling product coal from the mine.

The success of the Safety and Security Management System in place at the mine is evidenced by the absence of any public safety issues arising at the mine, the mine's excellent safety record (no lost time injuries in 1500 days as of 26 October 2004) and the general absence of conflict between coal trucks and private vehicles on the coal transportation route.

1.7 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

1.7.1 Introduction

WCM is committed to undertaking all activities at or in association with the Whitehaven Coal Mine in a manner which is consistent with its various consent, licence and lease conditions; minimizes adverse impacts to the physical, biological and social environments, ie consistent with operational requirements, and satisfies statutory criteria and reasonable community expectations.

The following sub-sections identify WCM's objectives, management procedures, monitoring programmes and performance for each of surface water; groundwater; noise; blasting; air quality; flora and fauna, rehabilitation; cultural heritage and spontaneous combustion and addresses WCM's objectives with respect to socio-economic aspects and the socio-economic benefits provided by the existing mine.

The information, which provides evidence of WCM's performance to date and the applicability of a continuation / extension of the existing programmes in association with the activities within the proposed Canyon extension, is also supported by the compliance review presented in **Appendix 1, Tables A1-1, A1-2, A1-3**.

1.7.2 Surface Water

1.7.2.1 Objectives

The Whitehaven Coal Mine lies within the catchment of Driggle Draggle Creek, with any runoff originating from undisturbed areas within WCM's leases flowing directly or indirectly to that creek and hence, the Namoi River. Limited opportunities also exist for the discharge of runoff from mine-disturbed areas, ie after appropriate retention time to satisfy licenced discharge criteria.

The management of surface water at the Whitehaven Coal Mine is undertaken with the following objectives.

- (xi) The quantity of water exhibiting elevated suspended solids loadings is minimized.
- (xii) Erosion is minimized.

- (xiii) Sediment-laden water is contained for a sufficient period that discharges, if occurring, satisfy the discharge criteria identified in Environment Protection Licence 10094, namely:
 - pH 6.5 to 9.0 (100th percentile limit);
 - suspended solids 50 mg/L (100th percentile limit),
 - grease and oil $-10 \text{ mg/L} (100^{\text{th}} \text{ percentile limit})$
- (xiv) Surface water is harvested off-site to the extent permissible, thereby minimizing water extraction from bores or other sources.
- (xv) Surface waters are not contaminated.
- (xvi) Downstream water users are not adversely affected by the Mine's operations, either in terms of quantity or quality.
- (xvii) The water management system is consistent with planned rehabilitation objectives and long-term land use.

1.7.2.2 Surface Water Management

Water within WCM's leases is nominally classified either as "clean", "sediment-laden" or "dirty", or "contaminated" depending on the source of the flow and its potential for physical or chemical contamination.

"Clean water" comprises water which emanates from areas undisturbed by mining activities, flows from sediment basins following its clarification in those structures or which is contained within or discharges from storage dams. Clean surface water flows either pass to natural drainage lines and hence off-site or are collected by diversion banks and directed to the storage dams for use on-site. All water flowing from sediment basins ultimately flows to storage dams.

As noted in Section 1.6.2.1 (i), a total of 13 sediment basins and 6 storage dams are currently in place with a combined storage capacity of approximately 87 ML.

"Dirty water" comprises water which does or could potentially contain elevated levels of suspended solids originating from or collecting within areas of mining-related disturbance, such as runoff from active overburden dumps, soil and coal stockpiles, roads and rehabilitated areas (until stabilized) and the open cut excavation.

Dirty water external to the active open cut excavation is collected by contour banks on the final landform or catch banks located on the natural surface downslope of the potential sources of pollution and directed to the sediment basins, with the water collecting within the sediment basins used for dust suppression. Water collected by the contour banks on the final landform is directed to the natural surface via rock-lined waterways. Water collecting within the sumps with the active mine area is either used directly for dust suppression purposes or is pumped to the surface for collection by the catch bank / sedimentation basin system. Clarified (clean) discharges (if any) flow from the sediment basins to the storage dams by low flow discharge pipes and/or spillways.

The sediment basins are either cleaned out once their capacity is reduced by 20% or supplementary structures are installed to provide the required storage volume.

The principal components of the "clean" and "dirty" water management systems currently in place at the Whitehaven Coal Mine are shown on **Figure 1.3**.

All sediment basins, storage dams and associated banks and drains and contour banks installed to date have been designed and constructed by Department of Lands (formerly DLWC) Soil Services personnel.

"Contaminated Water Management". Contaminated water comprises surface runoff from the fuel farm, truck and equipment parking, washdown and workshop areas (Figure 1.3), all of which could potentially contain petroleum products (principally grease and oil). Caltex maintains two 50000 L diesel fuel tanks positioned within a bund with a capacity to hold 240 000 L. The bunded area, which also contains stored oils, incorporates clay over plastic over a clay liner to minimize the potential of soil contamination in the event of a spill. Pipes and lockable valves are in place to enable removal of spills and rainwater from the area, with these materials placed in a tank for collection and off-site disposal. In the event of a tank rupture, fuel or oil would be pumped from the bunded area to drums or other containers for collection and off-site disposal.

Hydrocarbon-contaminated water originating from other areas, eg in the workshop area, is diverted to an oil separator, with the "clean" water used for dust suppression purposes. Spill kits are also maintained on the mine site.

Other contaminated water management measures in place include:

- the securing of all fuel and oil on site, eg at the various water pumps, within appropriately-sized and/or integrated bunds;
- immediate clean-up of spills of fuel and oils which may occur external to the bunded areas, with the form of clean-up depending on the source and location, magnitude and pollution potential, eg from use of spill kits to excavation and disposal of contaminated materials to bio-remediation;
- a three-phase contingency plan for containment and remediation of major spills or events which could potentially lead to contamination of surface or groundwater. Implementation of the contingency plan which is described in the Revised Site Water Management Plan, has yet to be required.

1.7.2.3 Monitoring

An event-related surface water monitoring programme is in place for the Whitehaven Coal mine as identified in **Table 1.7**. Existing surface water monitoring locations are shown on **Figure 1.6**.

SCALE 1:40 000

1.0

1.5

2.0 km

0.5

Figure Compiled by R.W. Corkery & Co.

0.5





WHITEHAVEN COAL MINING LIMITED Proposed Canyon Extension

Site (see Figure 1.6)	Site Description	Frequency	Parameters	Purpose
WW-7	Discharge from SD-1	Each overflow event when discharging	pH, TSS, Grease and Oil, Conductivity	To verify compliance with EPL
WW-8	Discharge from SD-2	Each overflow event when discharging	pH, TSS, Grease and Oil, Conductivity	To verify compliance with EPL
WW-9	Discharge from SD-3	Each overflow event when discharging	pH, TSS, Grease and Oil, Conductivity	To verify compliance with EPL
WW-11	Driggle Draggle Creek, upstream of any mine-related discharges *	If discharge is occurring at WW-7, WW-8, WW-9, WW-13 or WW-14	pH, TSS, Grease and Oil, Conductivity	To determine quality of water in Driggle Draggle Creek upstream of all mining-related activities
WW-12	Driggle Draggle Creek, downstream of any mine-related discharges *	If discharge is occurring at WW-7, WW-8, WW-9, WW-13 or WW-14	pH, TSS, Grease and Oil, Conductivity	To determine quality of water in Driggle Draggle Creek downstream of all mining-related activities. To compare with WW-11.
WW-13	Discharge from SD-4	Each overflow event when discharging	pH, TSS, Grease and Oil, Conductivity	To verify compliance with EPL
WW-14	Discharge from SD-5	Each overflow event when discharging	pH, TSS, Grease and Oil, Conductivity	To verify compliance with EPL

Table 1.7Surface Water Monitoring

1.7.2.4 Performance

Surface water management controls have operated effectively throughout the life of the Whitehaven Coal Mine to-date, with two discharges only occurring. Of these, one constituted a low flow discharge from site WW-9 (SD-3 which persisted for approximately seven days during July / August 2003. This discharge, a consequence of mine dewatering activities to the SB-3 / SB-6 array, did not reach Driggle Draggle Creek and the creek remained dry. The second discharge event, again from SD-3, occurred in January 2004 at the same time as flooding in the Peel and Namoi Rivers. On this occasion flows were occurring within Driggle Draggle Creek. The discharge analyses for each of these events is presented in **Table 1.8**.

1.7.3 Groundwater

1.7.3.1 Objectives

The management of groundwater at the Whitehaven Coal Mine is undertaken with the following objectives.

- (i) Groundwater is not contaminated as a consequence of WCM's activities.
- (ii) Mining activities, including groundwater extraction or any changes to the hydrologic regime resulting as a consequence of the mine excavation, do not adversely impact upon local groundwater users.

				-			
Discharge Source	Monitoring Site (EPL Site No) (see Figure 1.6)	Sampling Date	рН	Conductivity (µS/cm)	Suspended Solids (mg/L)	Grease & Oil (mg/L)	
EPL Di	scharge Criterion		6.5 - 9.0	N/S	10	50 *	
SD-3	WW-9 (3)	30.07.03	8.7	1730	5	**	
		04.08.03	8.9	1970	5	<2	
SD-3	WW-9 (3)	16.01.04	8.8	1830	27	<2	
	WW-11 (N/S)	16.01.4	7.5	1760	23	ND	
	WW-12 (N/S)	16.01.04	8.3	1870	18	ND	
* 20 mg 30 mg 50 mg	* $20 \text{ mg/L} - 50^{\text{th}}$ percentile limit $30 \text{ mg/L} - 90^{\text{th}}$ percentile limit $50 \text{ mg/L} - 100^{\text{th}}$ percentile limit						
** insuff	insufficient sample						
N/S not sp	/S not specified in licence						
ND not de	termined						

 Table 1.8

 Surface Water Discharge Analyses

The nature of the groundwater resource in the area of the Whitehaven Coal Mine is discussed in Section 3.5.1. However, it should be noted that only two non-WCM-owned bores are located within 1.5 km of the open cut as developed or currently approved (at Monitoring Sites GW-4 and GW-8 – **Figure 1.6**), the closest of which (GW-8) is at a distance of 1.0 km. Neither of these bores is operational.

1.7.3.2 Management

The potential for WCM's mining activities to adversely impact upon groundwater quality is dependent on the storage and use of liquid or soluble potential contaminants. With the exception of hydrocarbons (fuels, oils and grease) no materials occur or are retained at the Whitehaven Mine site which are likely to be a source of groundwater pollution: no contaminants that could be released by the site activities have been identified within the overburden, interburden or coarse reject returned to the mine.

The methods for the management of potential hydrocarbon contamination of groundwater is as described in Section 1.7.2.2, "Contaminated Water Management", with contingency plans also in place in the unlikely event that the availability or utility of groundwater at bores on surrounding properties is demonstrated to be adversely affected by WCM's mining or groundwater extraction activities. These contingency plans, which include strategies such as reduction of groundwater extraction and provision of alternative supplies, are identified in the approved Revised Site Water Management Plan.

1.7.3.3 Monitoring

WCM's performance with respect to groundwater management, the prevention of pollution and the assessment of impacts on groundwater availability to other surrounding users, is assessed through groundwater level and chemistry monitoring undertaken at the locations, frequency and for the parameters identified in **Table 1.9**. The results of the groundwater monitoring programme undertaken since the commencement of mining at the Whitehaven Coal Mine, and, for site GW-10, the groundwater quality analysis undertaken prior to the commencement of mining, are presented in full in **Appendix 2**. Monitoring sites are shown on **Figure 1.6**.

Site (see	Pagistarad		Frequency			Hours Pumped / Extraction Rate Volume	Purpose
Figure 1.6)	Bore No.	Property	SWL * ²	E.C. * ³	pH, Na, Ca, K, Mg, Fe, Mn, Al, As, CI, SO ₄ , HCO ₃ , NO ₃ and NO ₂ (as N)		
GW-1 *1	GW031896	"Bungalow"	Quarterly *4	Six monthly * ⁴		-	To determine existing status and any impacts
GW-2 *1	GW031897	"Bungalow"	Quarterly *4	Six monthly * ⁴		-	To determine existing status and any impacts
GW-3 *1	GW003087	"Gundawarra"	Quarterly	Six monthly		-	To determine existing status and any impacts
GW-4 *1	GW000880	"Merton"	Quarterly	Six monthly		-	To determine existing status and any impacts
GW-5 *1	GW000891	"Merton"	Quarterly	Six monthly		-	To determine existing status and any impacts
GW-6 *1	GW031999	"Womboola"	Quarterly (until mined)	Six monthly (until mined)	Annually (until mined)	-	To determine existing status and any impacts
GW-7 *1	GW001653	"Womboola"	Quarterly	Six monthly		-	To determine existing status and any impacts
GW-8 *1	GW005749	"Wilga"	Quarterly	Six monthly		-	To determine existing status and any impacts
GW-9	GW001613	"Whitehaven"	Quarterly	Six monthly		-	To determine existing status and any impacts
GW-10	GW001602	"Whitehaven"	-	Six monthly		-	To determine existing status and any impacts
GW-11 * ⁵	90BL249739	"Whitehaven"	-	-	Annually	Annually	To determine existing status and any impacts
GW-12	90BL252067	"Womboola"	Quarterly * ⁶	Six monthly *6	Annually * ⁶	Annually	To determine existing status and any impacts
* ¹ Non-G	Company owned bo	ore	$*^3$ EC = Electr	rical Conductivi	ty '	^{k⁵} Company produ	action bore
* ² SWL	 Standing Water I 	Level	* ⁴ Subject to A	Access	*	⁶ Following mini	ng through GW-6

Table 1.9 Groundwater Monitoring

1.7.3.4 Performance

A review of the monitoring results presented in **Appendix 2** shows that groundwater levels within the monitored bore closest to the mining operations and therefore most susceptible to any mine-induced drawdown effect (GW-10 – **Figure 1.6**) to have fluctuated but remained within the previously-recorded range, with groundwater levels in all other bores (other than GW-6) to have remained essentially static or to have gradually increased over the life of the mine. GW-6, an old bore on the site of a former tank, which accesses weakly cemented conglomeratic gravels and igneous rock fragments within an apparent palaeochannel approximately 200m south of the existing mining operations, has shown a decline in water level over 2004, with the decline also corresponding to the period of gravel overburden exposure and an increase in groundwater inflows within the open cut.

At Site GW-3 ("Gundawarra"), seasonal fluctuations have been observed over the life of the mine but are well within the range previously experienced. It is also noted, that the standing water levels reported in the DLWC Groundwater database for the bores at Sites GW-3, GW-5 and GW-10 are 65.5m; 35.1m and 33.8m respectively, that is, levels similar or substantially less than those recorded in these bores since the commencement of mining operations.

It is also noteworthy that there has been no suggestion from local landowners that WCM's activities are adversely affecting groundwater availability or quality. Rather, that the fluctuations observed are a reflection of their own use of the bores and the low yield of the fractured rock aquifer (0.4 to 0.9 L/s).

A review of the groundwater quality data presented in **Appendix 2** shows that:

- although electrical conductivities vary substantially between the various bores, they generally vary only marginally over time at each site;
- the water in most bores is neutral to mildly alkaline;
- the water in all bores, other than GW-6, is brackish to moderately saline, unsuitable for domestic use and of variable use in terms of stock water and for irrigation purposes; and
- despite the use of Nitrogen-based explosives, within the bores where a suite of parameters are monitored annually, Nitrogen (NO₃ and NO₂) levels have remained consistent over the life of the mine. It should be noted also that the mine is located in a rural area where nitrogenous fertilizers have historically and continue to be used.

In the absence of any consistent changes in the levels or quality of the groundwater in the WCM bores in closest proximity to existing and past mining activities, and the limited volume of groundwater extracted annually (either from bores or as inflows to the open cut – see Section 3.5.1) it can be concluded that the existing mine has had no perceptible impact on the groundwater resource.

WHITEHAVEN COAL MINING LIMITED Proposed Canyon Extension

1.7.4 Noise

1.7.4.1 Objectives

It is WCM's objective that activities at or in association with the Whitehaven Coal Mine are undertaken or managed in a manner:

- which minimizes noise generation;
- such that the impact of the noise on the local acoustical climate complies with statutory requirements;
- that complaints, if any, from the local community or local residents are responded to in a quick and consistent manner; and
- that any excessive noise generation problems are quickly rectified to the complainant's satisfaction.

1.7.4.2 Management

Noise management at the existing Whitehaven Coal Mine has, and continues to use, a combination of noise management and propagation path controls to maintain noise levels within statutory limits and minimize the acoustical impact on neighbours in what is a rural environment, including:

- installation and maintenance of appropriate mufflers on plant and equipment;
- introduction of equipment and/or facility refinements and/or replacements to reduce noise emissions, eg removal of the approved screening plant from the mine; replacement of the 988B front-end-loader (FEL) and 980C FEL used for crushing plant and truck loading with a single new 988G FEL servicing the crushing plant. The new 988G FEL was purchased with a factory-fitted noise suppression pack;
- changing operational procedures, eg loading coal into road trucks directly from a product coal bin as opposed to using front-end loaders;
- where operationally feasible, scheduling activities to minimize the operation of equipment in exposed locations when winds are blowing towards nearby residences;
- ongoing unsealed site road maintenance using the site-based grader;
- employee / operator education and noise awareness programmes;
- to the extent practicable, utilization of natural and/or constructed barriers, eg the overburden emplacement, soil stockpiles, ROM coal stockpiles or specially-constructed bunds to create an obstruction to the noise propagation path towards local residences;
- restricting activities within those approved under DA 72-03-2000. A review of **Table 1.5** shows that although most activities at the mine may be conducted between 0700 hours and 2200 hours and that limited activities may be undertaken to 0200 hours, routine hours of operation are substantially less than those approved.

WCM and/or Roche representatives regularly liaise with surrounding residents to seek feedback on all aspects of the mining activities, including noise.

Management of noise from coal transportation activities is achieved through:

- the use of sealed roads from the boundary of the mine site through to the Whitehaven Siding CHPP with road maintenance on the public roads undertaken as and when required by Narrabri and Gunnedah Shire Councils (and primarily financed by WCM under road maintenance agreements);
- use and appropriate maintenance of road-registered semi-trailers for off-site coal transportation activities;
- restrictions on coal haulage vehicle speeds on unsealed roads within the mine site;
- preferential use of quiet technology trucks, eg air bag suspensions to primemovers and trailers; and
- driver education and training.

1.7.4.3 Monitoring and Performance

Operational Noise

In accordance with commitments in the approved Noise Management Plan for the Whitehaven Coal Mine, two routine noise monitoring programme have been undertaken annually since the commencement of Stage 2 mining, one in February / March and the other in August / September in order to indicate to mine management the need, or otherwise, to further address noise-related matters. Additional programmes including attended monitoring and unattended monitoring with concurrent resident-activated recordings have also been undertaken on three occasions, two at "Bungalow" in April and July 2001, and the other at "Gundawarra" in May 2004.

The results of the bi-annual attended monitoring programmes have been presented in each annual environmental management report for the mine and can be summarised as follows.

- With the exception of noise levels at Bungalow on isolated occasions in early 2001, ie when mining activities and overburden disposal were at their northernmost extent and closest to that residence, mine noise emissions at project and non-project-related residences have routinely complied with applicable limits.
- With the progression of the mining activities to the south-east and away from all occupied residences, measured mine noise emissions have declined and are routinely inaudible, or audible but not measurable.

The April 2001 programme at Bungalow, an additional operational programme initiated in response to a complaint from the then landowner and which involved two early morning monitoring sessions under noise enhancing conditions, showed exceedances of the affectation criterion specified in DA 72-03-2000 and was a trigger to an extensive independent noise monitoring programme undertaken in July 2001 by Richard Heggie Associates Pty Ltd.

The outcomes of the July 2001 programme, though identifying limited exceedances of the affectation limit specified in the consent, also noted similar noise levels on the days the mine was not operating and prior to mining commencing but, nevertheless, were ultimately used to trigger WCM's acquisition of the "Bungalow" property.

The May 2004 monitoring programme, undertaken at the request of the landowners in response to a complaint to WCM regarding occasional elevated noise emissions, showed two occasions when the measured $L_{Aeq (15 \text{ minute})}$ noise level exceeded the affectation limit, one under weak and the other under moderate inversion conditions. It is noteworthy that, with the exception of the residents of "Bungalow", this represented the only mine noise-related complaint received over the life of the mine to-date.

Transport Noise

During the initial two years of mining operations, all coal from the Whitehaven Coal Mine was transported to Gunnedah Colliery coal preparation plant and/or Gunnedah train loader via the Kamilaroi Highway, Quia and Black Jack Roads, necessitating the movement of coal trucks past limited residences. Monitoring undertaken at the two closest residences following WCM's widening and hot mixing of Quia Road showed compliance with the nominated traffic noise criterion. Since late 2002 and WCM's acquisition of the former Vickery Siding area, use of Quia Road transporting coal from the mine has ceased.

1.7.5 Blasting

1.7.5.1 Objectives

Blasting, which is currently undertaken at the mine approximately fortnightly, has the potential to startle people and livestock and cause damage to structures as a consequence of excessive airblast overpressure, ground vibration or flyrock generation. It may also pose a risk to the public if undertaken in an inappropriate manner.

In view of the above, WCM's objectives with respect to blasting activities undertaken at the Whitehaven Coal Mine are to undertake blasting in a manner which:

- maintains airblast overpressure and ground vibration within statutory limits and to verify compliance through monitoring. The statutory levels applicable as identified in WCM's Environment Protection Licence, EPL 10094 are presented in **Table 1.10**;
- minimizes flyrock generation;
- minimizes the potential for blasting-induced damage to buildings, structures, infrastructure or services; and
- does not pose a risk to the public or livestock.

Criterion	Recommended Maximum	5% Exceedance Limit	0% Exceedance Limit			
Airblast Overpressure (dB Linear)	115 dBL	120 dBL	>120 dBL			
Ground Vibration (Peak Vector Sum)	5 mm/s	10 mm/s	>10 mm/s			
Hours of Blasting	9.00 am to 5.00 pm Monday to Saturday *					
* Blasting is not permissible on Sundays or Public Holidays without the prior approval of the EPA						

Table 1.10 Blasting Limits

1.7.5.2 Management

Management of blasting and blasting-related impacts at the Whitehaven Coal Mine is achieved through a combination of initial design (to satisfy environmental and public safety requirements) and progressive design refinement based on measured environmental and operational performance.

Blasting activities come under the jurisdiction of the DPI - DMR and must be undertaken in a manner which complies with the requirements of the Coal Mines (Open Cut) Regulation 1999 as documented in the Mine's Shotfiring and Explosives System (S&ES), a document which must be ratified by the District Inspector of Coal Mines.

At the Whitehaven Coal Mine, blasting impacts are controlled through:

- blast-face and drill hole surveys, and drill hole geology examination, to assist blast design by a qualified blasting engineer;
- blast-face orientation away from or at an oblique angle to residences where practicable;
- blasthole spacing in accordance with the design;
- careful selection and implementation of burden distance and stemming length;
- use of aggregates for stemming;
- maximum instantaneous charge (MIC) selection based on conservative and proven levels and/or conservative formulae;
- charge detonation sequencing and inter-row delay selection to provide for the progressive release of burden with minimal potential for vibration reinforcement effects;
- use of NONEL or electronic detonators;
- implementation of specific, documented procedures to reflect abnormal geological conditions, eg where cavities are encountered during the blasthole drilling programme;

- blast loading and initiation under the supervision of the blast design engineer and/or a suitably qualified shotfirer; and
- formal notification of neighbours in advance of, and again on the day of each blast.

1.7.5.3 Monitoring

Monitoring of individual blasts and blasting-induced impacts at the Whitehaven Coal Mine has taken or continues to take three principal forms.

- (i) Structural and superficial examinations of buildings. Prior to the commencement of blasting operations at the Stage 1 mine, WCM commissioned reports on the structural and superficial condition of each of the "Kelinda" (now known as "Silkdale"), "Bungalow", "Gundawarra", "Woodlands", "Merton" and "Willgai" residences to provide a yardstick against which any future claims regarding blasting-induced damage could be measured. A similar inspection was undertaken of the unoccupied "Wilga" residence in mid 2003.
- (ii) Airblast overpressure and ground vibration monitoring of all blasts. During the Stage 1 mining operations and the initial eight months of Stage 2 operations, monitoring was undertaken at the two closest residences, "Bungalow" and the project-related "Merton".
- (iii) From May 2001 to January 2002, monitoring was undertaken at "Merton", "Braymont", "Gundawarra" and "Bungalow", while from late January 2002 to early July 2003, monitoring was undertaken at "Merton", "Gundawarra" and "Bungalow". Since mid July 2003, monitoring has routinely been undertaken at "Merton", "Gundawarra" and "Wilga", with limited monitoring also undertaken at "Silkdale".
- (iv) Video photographing of each blast to assist in the identification of the cause of any non-compliant or unexpected blast result.

1.7.5.4 Performance

Table 1.11 presents a blasting summary since the commencement of the Stage 1 (trial) mine in February 2000, together with the details of exceedances at non-project related residences. A review of **Table 1.11** shows that:

• A total of 117 blasts were initiated a of 01 October 2004, of which three were undertaken during the Stage 1 mine and 114 were undertaken for Stage 2 mine operations. All blasts were undertaken within the approved blasting hours as specified in EPL 10094 with the earliest and latest blasts being initiated at 10.00 am and 4.40 pm. The majority of blasts have been initiated between 10.00 am and 3.00pm;

• Five blasts resulting in airblast overpressure levels of >115 dBL and <120 dBL, with one blast (#34) resulting in an airblast overpressure >120 dBL. The exceedance at Blast #34, a consequence of bridging in the fine stemming leading to rifling, precipitated the subsequent routine use of aggregates for blasthole stemming.

Calendar Year (Mine Stage)	No of Blasts Initiated	No of Blasts Monitored	Monitoring Locations	No of Blasts >115 dBL	No of Blasts >120 dBL	No of Blasts >5 mm/s	No of Blasts >10 mm/s	Comments			
2000 (1)	2000 (1) 3 3		2	0	0	0	0				
2000 (2)	00 (2) 7 7		2	1	0	0	0	*4			
2001 (2)	(2) 30 30		2-4 *1	3	1	0	0 0				
2002 (2)	30	30	3-4 * ²	1	0	0	0	*6			
2003 (2)	(2) 23 23		3-4 * ³	0	0	0	0				
2004 (2)	(2) 24 24 3 0 0 0 0										
* ¹ 2 to	* ¹ 2 to 17/05/01; 3 to 30/05/01; 4 to 14/12/01.										
* ² 4 to	$*^2$ 4 to 10/01/02; 3 thereafter.										
* ³ 3 to	$*^3$ 3 to 09/09/04; 4 to 17/12/03.										
* ⁴ Airt	* ⁴ Airblast 115.2 dBL at "Bungalow" (Blast #4).										
* ⁵ Airt (Bla	Airblasts 117.1 dBL at "Gundawarra" (Blast #26); 117.6 dBL at "Bungalow"; 115.8 dBL at "Braymont (Blast #31); 125.2 dBL at "Gundawarra" (Blast #34).										
* ⁶ Airt	Airblast 118.5 dBL at "Gundawarra" (Blast #47).										

Table 1.11 Blast Summary

Despite the fact that no blast has exceeded or approached the accepted criteria for blasting induced structural or cosmetic damage to buildings in 2002, WCM undertook a cosmetic repair and repainting programme at the "Gundawarra" residence.

No complaints regarding blasting impacts on land uses, eg stock grazing which is undertaken to within 200m of the active mine, have been received over the life of the mine to date.

1.7.6 Air Quality

1.7.6.1 Objectives

Despite the location of the Whitehaven Coal Mine in a rural area where surface disturbing / dust generating activities and dust generation off the unsealed public and private road network are a normal feature of the local environment, it is WCM's objective to minimize dust generation from the mine, ensure dust levels at adjacent residences as a consequence of its operations are consistent with the relevant total and incremental criteria, and to verify achievement of these objectives through monitoring. Maintenance of the mine site in a condition which minimizes or prevents the emission of dust from the premises is also identified as an operating condition within EPL 10094.

1.7.6.2 Management

Minimization / prevention of dust generation over the life of the existing Whitehaven Coal Mine has been and continues to be achieved through a combination of mine planning, operational scheduling and equipment positioning and restrictions, in combination with dust suppression activities using water sourced from the mine sump and the various sedimentation basins and storage dams on the mine site, including:

- limiting groundcover removal in advance of mining consistent with operational requirements. Under normal operational circumstances, a maximum of 80m is prepared in advance of mining;
- groundcover removal as part of the topsoil removal activities;
- where practicable, limiting soil (topsoil, subsoil, friable overburden) stripping activities to periods when there is sufficient soil moisture to prevent significant dust lift-off and avoiding periods of high winds. It should be noted, however, that throughout the life of the mine to-date, the Whitehaven area has experienced less than average rainfall conditions and for most of that time, has been drought declared;
- application of water to exposed surfaces, with emphasis on those areas subject to frequent vehicle / equipment movements which may cause dust generation and dispersal. Over the life of the mine to-date, water applications for dust suppression have ranged between 48 MLpa and 75 MLpa, with dust suppression water trucked to the mine site during late 2002 and early 2003 due to lack of water in on-site storages at the mine;
- use of water injection on the drilling rig;
- use of aggregates for blast hole stemming;
- sealing of the private mine access road from its junction with Hoads Lane;
- water application at the crusher and on the conveyor discharge point to the coal bin using a dedicated pump and water line from SB-6 (**Figure 1.3**);
- cessation of coal processing activities during periods of concurrent high winds and temperatures which cause coal dust dispersal, independent of water applications;
- ROM coal stockpile watering;
- progressive shaping and rehabilitation of areas once no longer required for mining purposes;
- speed limit restrictions on all vehicles and equipment on the mine site;
- equipment exhaust positioning to avoid exhausts impinging on the ground and causing dust lift-off; and
- use of sand covers on all product coal trucks.

1.7.6.3 Monitoring

WCM maintains a network of nine deposited dust gauges as shown on Figure 1.6 (Sites WD-1, WD-2, WD-5, WD-7, WD-8, WD-10, WD-12 and WD-13a) and required under EPL 10094, with additional sites not required under EPL 10094, ie WD-6, WD-9, WD-13 and WD-14 (Figure 1.6) either previously monitored or monitored to provide additional site based or ambient level information. No TSP / PM₁₀ monitoring is required under DA 72-03-2000, EPL 10094 or the approved Dust Management Plan for the mine, nor has been considered warranted: the Dust Management Plan states that "TSP monitoring . . . will be undertaken only in the event of measured exceedance of annual deposited dust guideline values."

1.7.6.4 Performance

Table 1.12 presents a summary of the deposited dust data for each of the sites previously and/or currently monitored in the vicinity of the Whitehaven Coal Mine.

	2000 - 2001*			2001 - 2002*			2002 - 2003*			2003 - 2004*		
SITE (see Figure 1.6)	Total Insol Solids (g/m ² / mth)	Ash (g/m²/ mth)	Ash %	Total Insol Solids (g/m ² / mth)	Ash (g/m²/ mth)	Ash %	Total Insol Solids (g/m ² / mth)	Ash (g/m²/ mth)	Ash %	Total Insol Solids (g/m ² / mth)	Ash (g/m²/ mth)	Ash %
WD-1	N/M	N/M	N/M	2.3	1.1	48	2.2	1.2	55	1.8	1.0	56
WD-2	N/M	N/M	N/M	2.6	1.3	50	3.6	1.7	47	2.5	1.3	52
WD-5	N/M	N/M	N/M	1.1	0.6	55	1.1	0.8	73	1.3	0.8	62
WD-6	1.1	0.7	64			64	N/M	N/M	N/M	1.6	0.9	56
WD-7	1.0	0.6	60	0.6	0.4	67	1.1	0.7	64	2.7	1.3	48
WD-8	1.6	0.8	50	1.4	0.8	57	2.4	1.5	63	1.2	0.8	67
WD-9	0.8	0.4	50	1.1	0.7	64	0.9	0.7	78	N/M	N/M	N/M
WD-10	1.4	0.9	64	2.4	1.1	46	2.6	1.6	62	3.6	2.2	61
WD-11	2.0	1.0	50	2.2	1.0	45	2.5	1.8	72	2.3	1.5	65
WD-12	1.2	0.6	50	0.8	0.5	63	0.9	0.5	56	1.2	0.7	58
WD-13	1.9	0.9	47	2.0	1.3	65	4.2	3.3	79	*1	*1	*1
* ² WD-13A				N/M	N/M	N/M	N/M	N/M	N/M	0.8	0.5	63
WD-14				1.6	0.8	50	N/M	N/M	N/M	1.0	0.5	50
Notes: N/M Not monitored												

Table 1.12 Mean Annual Deposited Dust Levels

12 month periods from 01 October to 30 September

 $*^1$ Site relocated in December 2003 due to approaching mine development (to within 50m)

*2 Relocation of WD-13

1.7.7 Flora and Fauna

1.7.7.1 Objectives

WCM's objectives for flora management on its leases as stated in the mine's Environmental Management Strategy and/or Flora and Fauna Management Plan (documents prepared in accordance with DA 72-03-2000) are to:

- undertake flora and fauna management in a manner that minimizes impacts in the short term, especially on Threatened and Protected species;
- minimize clearing of native vegetation;
- to ensure that each native bushland community type existing on the site prior to mining and to be removed or reduced in area by mining, is replaced with a community of the same or a similar dominant species at the ratio of 2ha replaced for each 1ha cleared;
- ensure hollow-bearing limbs, stags and trunks are salvaged and not burnt and used to reconstruct fauna habitat;
- develop protocols for the removal / relocation of any Threatened fauna identified, including Koalas;
- as far as practicable, to re-establish natural drainage patterns on the post-mining landform;
- implement contingency methods in an appropriate timeframe if monitoring shows the identified performance outcomes are not being achieved;
- to minimize grazing pressures on rehabilitated land;
- to minimize the potential for bushfire occurrence on, or incursion onto, WCM's leases; and
- verify achievement of the objectives by monitoring, where feasible.

1.7.7.2 Flora and Fauna Management

The following flora and fauna management strategies have been routinely applied throughout the life of the mine to-date and will be continued for the duration of the mine's life and beyond (as necessary) or, alternatively, will be implemented on the basis of monitoring outcomes or observations of performance.

(i) Minimizing the extent of clearing undertaken consistent with operational requirements. **Figure 1.3** and **Table 1.3** and Section 1.5.2 show that a total of 26.8ha approved for disturbance by mining, overburden emplacement and infrastructure in association with the existing mine will not be disturbed due to improved overburden management techniques and a decision to retain the existing surface facilities adjacent to the northern end of the mine pending approval to develop the Canyon extension.

(ii) Undertaking clearing and topsoil stripping campaigns on an as-needs basis within WCM's "Whitehaven" and "Merton" properties. On the "Womboola" property, clearing, ie felling of native bushland, is undertaken in a single campaign in the late summer or early autumn each year with sufficient area being cleared of trees to accommodate each subsequent year's mining requirements. Restricting clearing to the late summer / early autumn period is based on the recommendations of WCM's fauna consultant in order to avoid disturbing spring breeding birds and overwintering bats.

Each bushland clearing campaign is preceded by a pre-clearing inspection of mature trees bearing hollows (and trees in general) by the fauna consultant in order to determine if they are being used by Threatened species. The pre-clearing inspection also involves a search for Koala presence. In the event of the identification of Threatened species in the area to be cleared, relocation and/or other appropriate management procedures would be undertaken as recommended. However, such a situation has yet to eventuate.

Once the trees have been felled, they are removed to areas to be rehabilitated to native bushland to provide a mulch to the surface and fauna habitat. The groundcover vegetation, incorporated with the topsoil, is then removed on an asneeds basis to a maximum of 80m in advance of the mining activities.

(iii) Preferential direct transferral of soil and biomass from areas being developed to enable mine progression to areas of shaped post-mining landform.

The commencement of rehabilitation to native vegetation communities within the "Whitehaven" property, ie areas which prior to mining exhibited an exotic pasture vegetation, in order to ultimately achieve the 2ha for 1ha requirement identified in DA 72-03-2000 has meant that minimal stockpiling of "Womboola" topsoil has been undertaken to date.

In order to maximize the benefits of the native propagules contained within the "Womboola" topsoil, and minimize the potential for exotic species development, this topsoil is spread at half the thickness of that stripped, with the underlying subsoil and friable overburden sourced from "Whitehaven", "Merton" or "Womboola" as is most convenient operationally.

- (iv) Undertaking native bushland revegetation activities as identified in Section 1.6.2.1(x).
- (v) Undertaking feral animal control programmes. To-date control programmes have been restricted to shooting rabbits and foxes and feral cat trapping on the Company's landholding, external to the Mining Leases.
- (vi) Seedling protection from grazing by native animals using other than plastic guards, though not required to-date, will be regularly assessed and implemented as necessary.
- (vii) Implementation of erosion and sedimentation controls which, in their absence, could result in the degradation of the Driggle Draggle Creek and possibly, the Namoi River.

- (viii) Encouragement and/or establishment of habitat along the fringes of the various water storages on the mine site. Although no formal habitat establishment activities have been undertaken to date, habitat for native mammal, bird, reptile and amphibian species has naturally developed around many of the water management structures at the mine site.
- (ix) Fencing in order to encourage natural regeneration of native bushland in the absence of grazing pressure, though not required to any extent to date, will be implemented prior to any introduction of stock to areas of the final landform revegetated to exotic pasture. Stock is also excluded from these areas of WCM's leases by agricultural fencing.
- (x) Ongoing maintenance of establishing vegetation including watering of seedlings in the initial summer following planting (in the event of drought conditions) and, if required, re-topsoiling and/or re-seeding, drainage control inspection and maintenance.
- (xi) Fire exclusion through the maintenance of fire breaks. Though not required todate, WCM also maintains a fire fighting trailer on the mine site and has access to a 15000L water truck and various items of earthmoving equipment which could be employed in the event of a fire outbreak. Regular liaison with the local bushfire brigade, together with a documented Bushfire Management Plan, would also assist in the earliest response and control of any fire outbreaks on or adjacent to the mine.

1.7.7.3 Monitoring

WCM recognises that monitoring of rehabilitation / regeneration success is an integral part of a successful rehabilitation programme, particularly where the programme involves the reestablishment of native species in a manner which aims to emulate and extend the pre-mining / pre-agricultural clearing community and provide habitat for native fauna in the longer term. Monitoring is also recognised to have benefits with respect to rehabilitation methodology design at other, as yet to be commenced, mine developments and as a demonstration of the Company's performance and commitments to the maintenance of biodiversity.

Flora and fauna monitoring programmes are identified in the document entitled "Flora and Fauna Management Plan No 2 for the Whitehaven Open Cut Coal Mine" approved 29 February 2002 and include:

- the establishment of permanent photopoints and 100m x 100m quadrats in each native vegetation community to be disturbed over the life of the mine, and in each 10ha land rehabilitated to native vegetation;
- annual monitoring of all quadrats for five years and bi-annual monitoring thereafter, with each programme comprising foliage cover measurements along two 100m step-point transects; an assessment of species composition using the modified Braun-Blanquet (Poore) Scale, and tree and shrub counts to quantify deaths and regeneration; and

• spring / early summer native fauna diversity monitoring in the flora monitoring quadrats on areas rehabilitated to native vegetation and within areas of each identified fauna habitat not to be disturbed by mining activities. As with the flora programme, fauna monitoring is to be undertaken annually for the first five years and bi-annually thereafter. Fauna monitoring is to include sampling for amphibians, birds, mammals, microbats and reptiles.

The flora and fauna monitoring programmes, each undertaken by qualified and experienced consultants, will also include inspections for noxious weeds and feral animals and the provision of any recommendations with respect to additional works requirements to WCM.

Due to the persistent drought conditions which have occurred throughout the life of the mine todate and the commencement of rehabilitation to native bushland in August 2003, the initial flora quadrat establishment and monitoring was undertaken in April 2004, with control quadrats established in each of the potentially affected vegetation communities identified by Geoff Cunningham Natural Resource Consultants in DA 72-03-2000 (GCNRC, 2000(b)), ie vegetation Community 4 (Undulating Country – Treeless or with Scattered Trees – uncultivated) and Community 8 (Undulating Country with Box or Box / Ironbark [*Eucalyptus spp.*] / White Cypress Pine Communities. A single quadrat was also established in the initial area assigned to native vegetation establishment. Quadrat locations are shown on **Figure 1.3**.

Monitoring of the natural fauna habitats identified in the Flora and Fauna Management Plan was undertaken in conjunction with the fauna investigations in the Canyon area but was deemed unwarranted in the rehabilitated area due to the infancy of the rehabilitation at that time. This work has, however, now been initiated.

1.7.7.4 Performance

Flora and fauna management procedures at the Whitehaven Mine to-date as identified in Section 1.7.7.3 have been successful in the achievement of WCM's objectives and the satisfaction of DA 72-03-2000 particularly with respect to minimization of impacts on Threatened and Protected species, eliminating grazing presence and fire, drainage re-establishment and the re-establishment of biomass to encourage fauna habitat development.

A total of 18.5ha had been subject to native vegetation re-establishment procedures as of 01 October 2004, all of which lies within areas comprising improved pasture of cropping land prior to mining. A further minimum 24.5ha has been assigned for native bushland establishment within "Whitehaven" and "Merton" which, together with all 43ha of approved disturbance within "Womboola", will readily achieve an area of post-mining native bushland at least equivalent to, if not greater than that required by the mine's development consent.

The initial (April 2004) monitoring of vegetation establishment within the native revegetation area (Quadrat 2 - Figure 1.3), showed a 66% vegetative cover with approximately 25% of the cover provided by perennial native grass and broadleaf species. Trends in the nature, cover and abundance of the various species will be provided following subsequent assessments and used as the basis for recommendations on operational changes, vegetation maintenance, etc if warranted.

Pre-clearing inspections have identified no Threatened species requiring translocation.

1.7.8 Rehabilitation and Land Use

1.7.8.1 Objectives

WCM's rehabilitation and land use objectives for areas affected and areas unaffected by mining are as follows.

• Areas affected by mining – short term

- (i) To stabilize all earthworks, drainage lines and disturbed areas that are no longer required for mine related activities.
- (ii) To reduce the visibility of mining activities from adjacent properties and the local road network.

• Areas affected by mining – long term

- (i) To provide a low maintenance, geotechnically stable and safe landform which is commensurate with a variety of agricultural land uses and/or nature conservation.
- (ii) To blend created landforms with the surrounding land fabric.
- (iii) To revegetate a minimum 2ha for each 1ha native bushland disturbed using native flora species with the objective of establishing vegetation communities which emulate the existing vegetative communities or those that occurred prior to agricultural related disturbance.

• Areas to be unaffected by mining

- (i) To remove grazing pressure from areas of relatively intact native tree and shrub communities and thereby encourage the extension / diversification of those communities.
- (ii) To continue conservative stocking of open grassland communities with cattle to reduce the bulk of material present and reduce fire hazard.
- (iii) To continue grain production / pasture rotation in previously cultivated areas.

1.7.8.2 Management

Achievement of the rehabilitation and land use objectives as identified in Section 1.7.8.1 is achieved through a combination of:

- appropriate soil management as described in the approved Soil Stripping Management Plan and Section 1.6.2 (iii);
- final landform shaping, preparation and revegetation as described in the approved Flora and Fauna Management Plan and Section 1.6.2 (ix); and
- surface water management in accordance with the approved Revised Site Water and Erosion and Sediment Control Plans and Section 1.7.2.1.

1.7.8.3 Monitoring and Performance

As discussed in Sections 1.6.2.1 (x) and 1.7.7.4, WCM is undertaking the progressive rehabilitation of all areas of disturbance at the Whitehaven Coal Mine once they are no longer required for operational purposes and have plans and processes in place to ensure the availability of adequate soil materials and the achievement of native bushland re-establishment in accordance with the requirements of DA 72-03-2000.

Similarly, as noted in Section 1.7.7.3, rehabilitation monitoring programmes are in place to verify the achievement of the Company's rehabilitation objectives in areas to be returned to native vegetation. Monitoring of the success of rehabilitation to pasture is undertaken by means of regular visual inspections for, for example, adequacy of cover, evidence of plant regeneration, is seed set, dispersal and germination and evidence of erosion, with the outcomes of these inspections used to determine the need for ameliorative or maintenance programmes such as erosion rectification, fertilizer reapplication.

As appropriate, the procedures and monitoring programme already in place would be extended to include the proposed Canyon extension.

1.7.9 Cultural Heritage

1.7.9.1 Introduction and Objectives

An assessment of the pre-European archaeology and cultural heritage of an area of approximately 750ha incorporating WCM's leases was undertaken as part of the Stage 2 Mine EIS and identified three sites as shown on **Figure 1.3** and annotated "Whitehaven 1, 2 and 3". A record of a fourth site (No. 20-4-0013 – **Figure 1.3**) was identified through an examination of the NSW National Parks and Wildlife Services' Minark Sites Register. Of the four sites, sites "Whitehaven 1" (an isolated flake), "Whitehaven 2" (an open scatter) and Site No 20-4-0013 were located external to the western boundary of ML 1471, with one site only ("Whitehaven 3") located within ML 1471 but in excess of 500m from the limit of approved mining activity.

Given the location of these sites, WCM's principal objectives with respect to their management has been one of protection from damage or visitation in conjunction with workforce education as to their obligations under the National Parks and Wildlife Act 1974 and NSW Heritage Act 1977. Additionally, WCM has sought to protect any other sites which may occur but were not located during the initial survey by limiting disturbance and engaging representatives of the Red Chief Local Aboriginal Land Council to act as monitors through all topsoil removal activities.

1.7.9.2 Management

Cultural heritage management at the Whitehaven Coal Mine is undertaken in accordance with the approved "Archaeology and Cultural Management Plan", with protection of sites "Whitehaven 1" and "Whitehaven 2" and 20-4-0013, which lie outside ML 1471, having been achieved through:

- the placement of a fence along the western boundary of the lease;
- the restriction of access to areas of the Company's landholding external to the lease to authorized personnel only. Signs indicating that the areas containing these sites are "no go" areas are positioned on the fence;
- workforce education as to individual's obligations and responsibilities.

No formal protection or management procedures other than workforce education have been implemented, or considered warranted, to-date with respect to "Whitehaven 3", given that the site lies approximately 600m from any mining activity undertaken to-date and outside the Mine's existing water management system.

1.7.9.3 Monitoring and Performance

With the exception of Red Chief's monitoring of all soil disturbing activities and vetting requests for access to the paddock containing site's Whitehaven 1 and 2, no formal monitoring programme has been warranted.

The management procedures and monitoring undertaken have been successful in the protection of the known Cultural Heritage sites, with no access required to the paddock containing sites Whitehaven 1 and 2, other than by Company management and the environmental officer and no evidence of additional cultural material having been identified during the soil stripping monitoring programme.

"Whitehaven 3" remains undisturbed.

1.7.10 Spontaneous Combustion

1.7.10.1 Management

Whitehaven Coal has a low percentage of inorganic sulphur and hence has a low potential for exothermic oxidation reactions. Notwithstanding, a Spontaneous Combustion Management Plan is in place which identifies the procedures to be undertaken in the event of such an incident or, for example, in the event of a build-up of coal stocks: extended residence time in coal stockpiles increases the potential for spontaneous combustion incident.

The coarse reject emplaced at the mine has a low (14%) volatile matter component and similarly, a low propensity for spontaneous combustion. These factors, combined with the progressive emplacement and burial of the reject in accordance with the WCM's Section 126 (Coal Mines Regulation Act, 1982 Approval) minimizes any potential for spontaneous combustion from this source.

Spontaneous combustion within other areas of the overburden and interburden disposal is not an issue as there are no unoxidized coal seams in the overburden overlying the mined plies. Additionally, the presence of experienced personnel in the ROM coal and reject stockpile areas during working hours who are trained to watch for indications of spontaneous combustion and respond accordingly, provides a mechanism for early detection and extinguishment of any spontaneous combustion, should it occur.

1.7.10.2 Performance

Over the life of the mine to date, a single incidence of spontaneous combustion only has been recorded. That incident, in 2002, was a result of extraordinary circumstances and occurred in a stockpile of heat-affected coal which had been extracted from adjacent to a dyke and was retained for an extensive period awaiting washing. Once recognized, the incident was reported and the affected coal extinguished by excavation, spreading and saturation with water.

1.7.11 Socio-economic Aspects

1.7.11.1 Objectives

WCM is committed to its acceptance as a valued member and contributor to the community and has set the following objectives to achieve this commitment.

- Promotion of local employment at its operations. Promotion of local employment assists in reversing the outward migration trend experienced in many regional communities.
- Preferential support of local business enterprises.
- Provision of support, and active participation in local community and charitable groups, eg Rotary, Local Bush Fire Brigades.
- Promotion of, and education of the community with respect to, responsible mining and environmental management practices.
- Maintaining a long term presence in the local area through the development of new ventures and thereby providing continuity of employment and community support.
- Maintaining an honest, open and free exchange of information between the Company and the community through community consultation.

1.7.11.2 Management and Performance

As noted in Section 1.6.8, approximately 65% Roche employees, 100% of WCM employees and 90% Howard Haulage employees were resident in the local area prior to the commencement of the mine, with all "non-local" permanent employees now resident in the Gunnedah / Boggabri area. Similarly, the majority of support service personnel and businesses, eg for maintenance, provision of supplies and services, are local.

WCM's annual expenditure at the mine exceeds \$20M, of which direct wages alone to its own or contracted employees, represent an injection of some \$2.5M into the local economy annually. As members of the Gunnedah / Boggabri community, mine-related employees also contribute socially and economically through their involvement in community sporting, educational and social organizations and expenditure of varying components of their disposable income.

WCM also contributes to local community groups by way of sponsorships and donations, eg to New England Health.

WCM's success in the achievement of its objectives is demonstrated by its acceptance as an integral and valued member of the community and the support for the Company's existing and proposed future operations by the vast majority of community members.

1.7.12 Complaints

WCM has received a total of 38 complaints (including comments or queries received on the complaints line) in the years since the commencement of operations at the Whitehaven Coal Mine in January 2000, of which 31 were received during the initial one and a half years of operations, ie prior to 30 September 2001, a period of infrastructure development and the establishment of site-specific practices and procedures.

Table 1.13 presents a summary of the complaints received by year, subdivided on the basis of the issue.

Year	Issue										
	Reported Blasting Damage	Water Truck Driver Behaviour (Hoads Lane)	Coal Trucks (Hoads Lane / Blue Vale Road)	Coal Trucks (Quia Road)	Mine Dust (General)	Dust (Hoads Lane)	Blast Dust	Coal Truck Noise (Quia Road)	Mine Noise	Coal Truck Load Coverage	
2000	1	2	3	2		2		2			12
2001	8		1		1	3	3	2	1	2	21
2002				1							1
2003											
2004	1		2						1		4
											38

Table 1.13 Complaints Summary

All complaints were responded to in accordance with WCM's complaints management procedures. Furthermore, where relevant, the complaints prompted implementation of disciplinary procedures and/or workforce / contractor re-education programmes and a reinforcement of WCM's expectations. With respect to **Table 1.13**, it should be noted:

- complaints relating to water truck driver behaviour and dust on Hoads Lane occurred prior to WCM's sealing of that road, an action which was undertaken prior to timing requirement identified in DA 72-03-2000;
- complaints relating to noise on Quia Road pre-dated the hot-mixing of that road; and
- complaints relating to damage to structures attributed to blasting were, with one exception, in response to blasts which were in compliance with the limits set under DA 72-03-2000 and EPL 10094, with the majority of the complaints originating from the "Gundawarra" residents. Notwithstanding the compliant nature of the blasts, WCM has undertaken repairs to that residence.

1.8 CONSULTATION

Prior to and during the preparations of this SoEE, WCM formally consulted with the following Local and State Government Authorities to ascertain their requirements and any specific issues they required to be addressed in the documentation.

- (i) Department of Infrastructure, Planning and Natural Resources (Planning).
- (ii) Department of Infrastructure, Planning and Natural Resources (formerly DLWC).
- (iii) Department of Environment and Conservation (formerly EPA).
- (iv) Department of Environment and Conservation (formerly NPWS).
- (v) Department of Primary Industry (formerly DMR).
- (vi) Department of Primary Industry (formerly NSW Agriculture).
- (vii) Roads and Traffic Authority.

Responses were received from all Authorities other than RTA.

The impending application and its implications were also discussed at the community consultative committee meeting of 22 September 2004 and with the following neighbours to the mine or the Whitehaven Siding CHPP.

- Mr and Mrs C Atkinson ("Gundawarra").
- Mr R Mitchell and Ms C Palmer ("Merton").
- Mr and Mrs P Scott ("Willgai").
- Mr and Mrs E Homer ("Silkdale").
- Mr and Mrs K Blanche ("Whitehaven").
- Mrs K Fletcher ("Woodlands").

- Coal and Allied (owners of "Wilga" and "Blue Vale").
- Mrs H Cruickshank.

Relevant matters raised in the consultation process have been addressed in the appropriate sections of this SoEE.

1.9 DOCUMENT PREPARATION

The investigations and report writing for this Statement have been coordinated by Mr Bob Corbett, B.Sc.(For), Manager – Environmental Services with AMCI Australia Pty Ltd. Assistance with the preparation of this document has also been provided by:

- Mr Chris Burgess: Area Manager, Whitehaven Coal Mining Pty Ltd;
- Mr John Tynan: Mining Engineer, Roche Mining;
- Geoff Cunningham Natural Resource Consultants Pty Ltd (Flora, Soils and Land Capability);
- Countrywide Ecological Service (Fauna);
- Archaeological Surveys & Reports Pty Ltd (Cultural Heritage Assessment); and
- Richard Heggie Associates Pty Ltd (Air Quality and Noise).

1.10 ONGOING DOCUMENTATION

WCM is committed to undertaking all component activities of its remaining operations at the existing approved Whitehaven Coal Mine and the proposed Canyon extension in a responsible and pro-active manner which enables the continued co-existence of the various land uses in the area, is environmentally and socially responsible, and minimises any real or perceived impacts on other members of the community. Central to this approach would be continued regular contact with neighbours, an open door policy, and a willingness to openly discuss actual or perceived problems and implement appropriate changes to operational procedures if required. Policies and procedures which are in place and operating successfully at the existing Whitehaven Coal Mine would be continued.

Successful environmental management invariably involves regular, organised documentation to ensure that, irrespective of personnel changes, all aspects of planning, environmental control, monitoring and responses to problems are properly recorded.

Should development approval be granted for the proposed Canyon extension, WCM would extend its commitment to the Mining, Rehabilitation and Environmental Management Process (MREMP) to cover both the existing approved Whitehaven Coal Mine and Canyon operations through the provision of an updated Mining Operations Plan (MOP) and extension of the reporting undertaken in the Annual Environmental Management Reports (AEMRs).

Both documents would be prepared in accordance with DPI – DMR's document entitled "Guidelines to the Mining, Rehabilitation and Environmental Management Process" dated April 2002, but with the AEMR also including those additional aspects identified in DA 72-03-2000 (as amended) and the development approval for the Canyon extension.

In accordance with the Guidelines, the Section headings for each of the above documents would be as follows.

MOP

- Introduction
- Pre-MOP Environment
- Land Preparation
- Mining Activities
- Rehabilitation
- Environmental and Rehabilitation Risk Assessment
- Environmental Management Controls

AEMR

- Introduction
- Summary of Operations
- Environmental Management and Performance
- Community Relations
- Rehabilitation
- Continuous Improvement and Target Initiatives

As has been the case with similar documentation for the existing mine, each document would be accompanied by relevant plans, photographs and appendices.