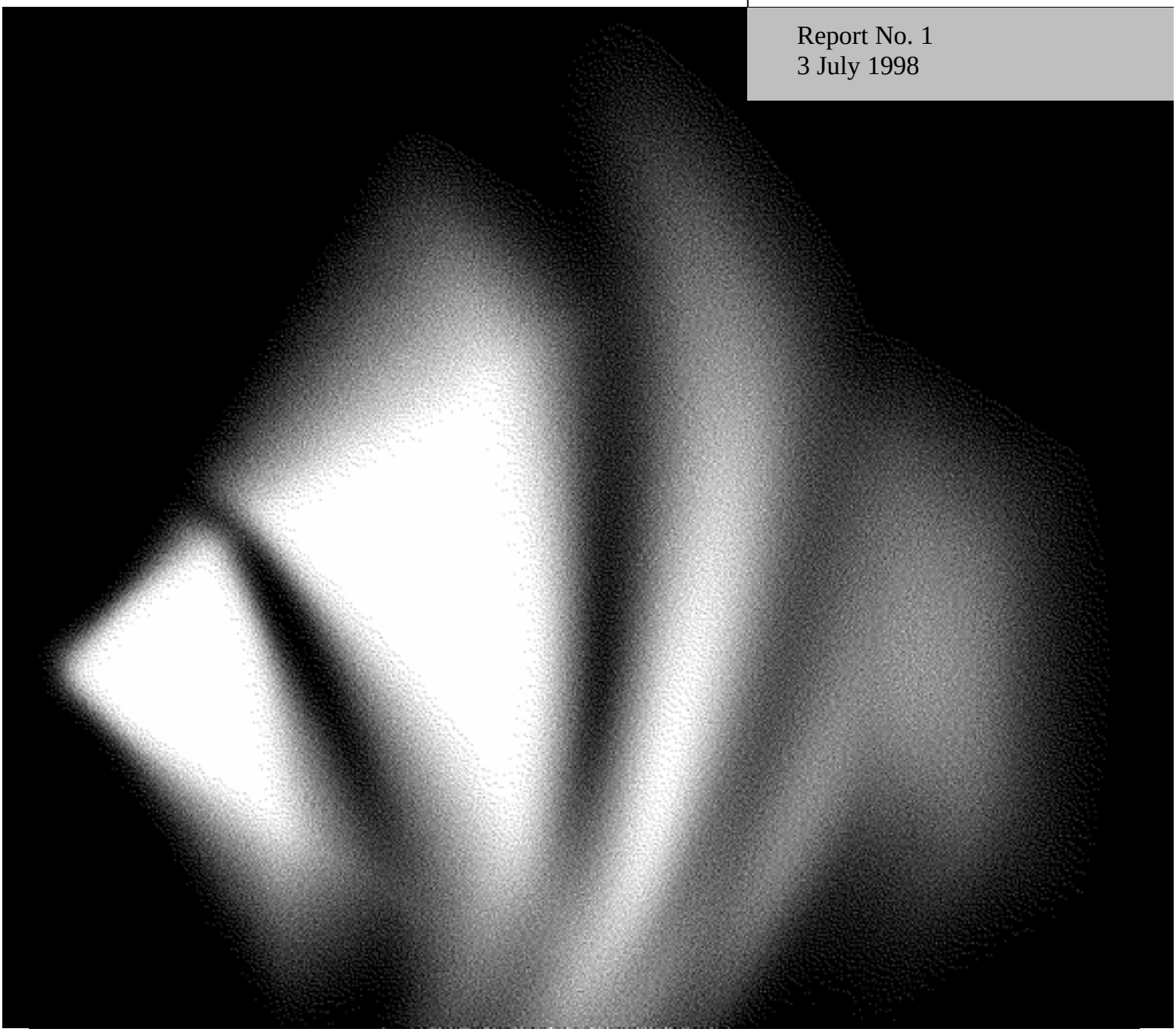
PRODUCTIVITY COMMISSION

The Australian Black Coal Industry

Inquiry Report

Volume 2: Appendices

Report No. 1
3 July 1998



A CONDUCT OF THE INQUIRY

A.1 Introduction

This appendix outlines the inquiry process and the organisations and individuals which have participated in the inquiry.

Following receipt of the terms of reference on 9 July 1997, the Commission placed a notice in the national press inviting public participation in the inquiry and released an issues paper to assist participants in preparing their submissions. A list of those who made submissions is in Section A.2.

The Commission also held informal discussions with organisations, companies and individuals to gain background information and to assist in setting an agenda for the inquiry. Organisations visited by the Commission are listed in Section A.3.

In November 1997, the Commission held public hearings in Sydney and Brisbane. Following release of the draft report, the Commission held a second round of public hearings in May 1998. In total, 16 individuals and organisations gave evidence (see Section A.4). A transcript of the hearings was made publicly available.

Mr Bill Scales, AO was Presiding Commissioner for this inquiry until 27 February 1998, when he resigned from the Commission. He was replaced as Presiding Commissioner by Mr John Cosgrove from that date. Mr Keith Horton-Stephens and Mr Nicholas Gruen were also Commissioners on the inquiry, but left the Commission prior to the completion of the final report.

A.2 Submissions received

Participant	*Submission No.*
ACB Consulting Services Pty Ltd	51
ARCO Coal Australia Inc.	21
Asia Pacific Strategy Pty Ltd	1, 38, 50, DR53
Association of Mine Related Councils	DR57

Australian Coal Association	31
Australian Mines and Metals Association Inc.	14
Bach Consulting Pty Ltd	20
Bagot, T. Mr	17, 37
BHP Coal Pty Ltd	30, DR63
Callide Coalfields Pty Ltd	6
Camberwell Coal Pty Ltd	13
Department of Primary Industries and Energy	43
Department of Primary Industries and Resources South Australia	46
Department of Workplace Relations and Small Business	40
Drayton Coal Pty Ltd	48
Durie, R. Dr	DR56
Easton Business Consultants	7, 47, DR54
Emerald Shire Council	DR62
Exxon Coal and Minerals Australia Ltd	3
FreightCorp	27, DR67
Gladstone Port Authority	10
Joint Coal Board	19, 44, DR59
Leggate, J. Mr	28
Long-Airdox Australia Pty Ltd	5
Michael Minns Human Resources Pty Ltd	8
MIM Holdings Ltd	18
Newcastle Port Corporation	16
NSW Government	26, DR68
NSW Minerals Council	25, 35, 52, DR60
Pacific Power	39, DR55
Port Kembla Coal Terminal	45
Port Waratah Coal Services Ltd	42
Ports Corporation of Queensland	9, DR58, DR64

Queensland Government	32, DR61
Queensland Manufacturing Industry Forum	2
Queensland Mining Council	24
Queensland Rail	12, 34, DR66
Rail Access Corporation	23
Rio Tinto Energy	22, 49, DR65
Roberts, I. Mr	33
Ruston, R. Mr (Member Joint Coal Board)	36
Shell Coal Pty Ltd	29
Smith, G. Dr	11
The Allen Consulting Group Pty Ltd	4
Thiess Contractors Pty Ltd	15
United Mining Support Services	41

* DR indicates that the submission was received after draft report.

A.3 Visits

Australian Capital Territory

ABARE

Department of Primary Industries and Energy

Development Allowance Authority

Minerals Council of Australia

New South Wales

Allied Mining — South Bulli Mine

BHP — Elouera Colliery

BHP Steel Colleries Division

Bloomfield

Bulga Mine

Camberwell Coal Pty Ltd

Centennial Coal Company

CFMEU

Coal Operations Australia

CRC for Black Coal Utilisation

Cummnock Coal

Exxon Coal and Minerals Australia

FreightCorp

Hood, M. Dr

JCD Australia

Liddell Coal

Mt Thorley Coal Loader

Muswellbrook Coal Company Ltd

Nippon Steel

NSW Department of Mineral Resources

NSW Department of Transport

NSW Minerals Council

NSW Treasury

Oakbridge

Peabody Resources

Port Kembla Coal Terminal

Port Waratah Coal Services Ltd

PowerCoal

Rail Access Corporation

South Bulga Mine

United Colleries

Wollongong City Council

Queensland

ARCO Coal Australia Inc.

Australian Coal Association

Australian Mines and Metals Association Inc.

BHP Coal Pty Ltd

Burton Coal Project

CRC for Mining Technology and Equipment

Crinum Mine

Emerald Shire Council

Ensham Mine

Ensham Resources Pty Ltd

Gladstone Port Authority

Hay Point Coal Terminal

MIM Holdings Ltd

Newlands Mine

Oaky Creek No. 1 Mine

Peak Downs Mine

Queensland Department of Mines and Energy

Queensland Department of Transport

Queensland Minerals Council

Queensland Ports Corporation

Queensland Rail

Queensland Treasury

Rio Tinto Energy

Shell Coal Australia

South Blackwater Mine

Thiess Contractors Pty Ltd

Victoria

Australian Mines and Metals Association Inc.

Department of Workplace Relations and Small Business

National Competition Council

Rio Tinto Energy

Western Australia

Wesfarmers Coal

Overseas — United States and Canada

ARCO Coal Company

BHP Minerals New Mexico Operations

British Columbia Ministry of Employment and Investment

Cyprus Amax Minerals Company

Cyprus Cumberland Mine

Foidel Creek Coal Company (Twentymile Mine)

John T. Boyd Company

Kennecott Energy Company

Los Angeles Export Terminal Inc.

United Mine Workers of America

Westshore Terminals Ltd

A.4 Public hearing participants

ARCO

Asia Pacific Strategies

Australian Mines and Metals Association

Bach Consulting

Bagot, T. Mr

BHP Coal

Callide Coalfields Pty Ltd

Camberwell Coal

Easton Business Consultants

FreightCorp

NSW Minerals Council

Ports Corporation of Queensland

PowerCoal

Rail Access Corporation

Rio Tinto Energy

Shell Coal Australia

B COAL AND COAL MINING

This appendix explains the geological and technical terms necessary to understand the black coal mining industry and its place in the Australian economy. It covers geology, exploration, coal mining and describes the physical characteristics of coal which affect its quality, end use and price.

B.1 Geology

The geology of a black coal resource has a significant impact on the costs of extracting the coal. The existence of high quality, or abundant resources is not enough to guarantee that mining a black coal seam will be economically viable. For example, the large high quality black coal resources identified in Australia's Cooper basin will not be mined in the foreseeable future, being too deep to exploit at current prices (sub. 46, pp. 4–5).

Coal is found in layers between other layers of sedimentary rocks. The layers of rock are referred to as strata. Layers of coal are known as seams.

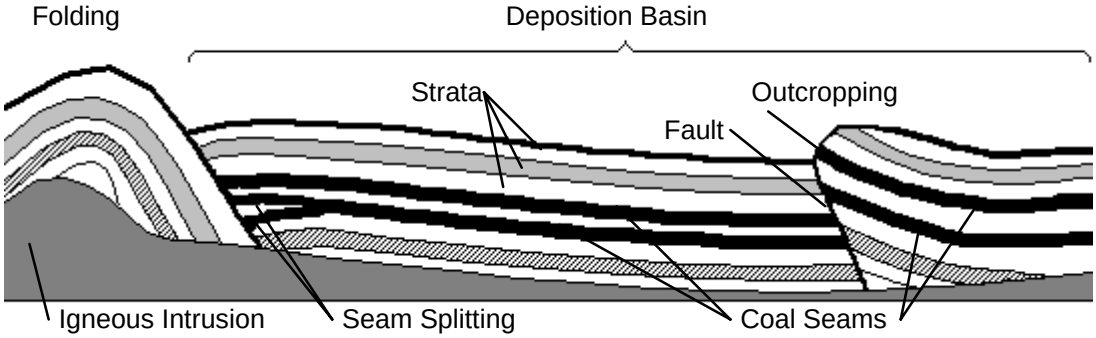
Layers of rock are formed by sediment building up in low lying areas known as deposition basins. Over millions of years these layers of sediment are transformed into sedimentary rocks under pressure from overlying material.

Coal is formed when plant material is covered by a layer of sediment, preventing complete decomposition. The long period of heat and pressure, caused by the weight of the overlying layers, produces chemical changes that force out oxygen and hydrogen, leaving behind a layer of carbon rich coal. Coal seams can be less than a millimetre thick to over 100 metres thick in some locations around the world.

The exact nature of a seam of coal has a major impact on the economics of a potential mine. Generally, for any given quality of coal, the thicker the seam and the nearer the seam is to the surface, the less expensive it is to mine. The type of surrounding rock also will affect mining costs, as will the existence of rock mixed up amongst the coal.

In addition to the location and the purity of the resource, other geological factors have an important impact on the viability of a coal mining operation. Figure B.1 shows common rock strata formations and the geological terms that are applied.

Figure B.1: **Geological formations related to coal mining**



Movements in the earth's crust can create pressure that causes sections of it to concertina. The original horizontal strata become folded and may even become vertical. Where sections of the crust move relative to each other, this pressure can cause faulting. Along a fault, the rock strata will be non-continuous as a result of being lifted, depressed or moved sideways. Mining in the presence of significant faulting poses problems in extracting the coal and in terms of safety as the rock can be unstable. Consequently, the existence of such conditions can impose significant costs on the mining operation.

Volcanic activity can cause molten igneous (volcanic) rock to intrude into the sedimentary strata before it cools. Such a process can cause sedimentary layers of rock, including coal seams, to dip rapidly away from the surface and be altered in composition. It also can cause coal seams to split or become disrupted (non-continuous).

Finally, weathering and erosion can cause an outcropping or exposure of the coal seam on the surface. Many of the early discoveries of coal in Australia were of outcropping seams in the Newcastle and Illawarra regions.

In mining coal, it is common to encounter complications from the above geological processes. In terms of economic viability, complicated mine geology generally means greater costs of extraction and can render even high quality coal resources uneconomic. For example, significant faulting of a coal seam can make longwall mining impossible. Alternatively, favourable geology can be advantageous to a mine, allowing the operation to be highly productive simply through ease of access to a high quality resource.

B.2 Exploration

Interest in mineral resources has a long history in Australia, beginning with the appointment of geological surveyors in various colonies around 1850. It was as

a result of these early surveyors' efforts that many of the coal fields now in production were first identified.

Locating and evaluating a coal deposit is the first step of the mining process. Considering the many geological problems outlined in the previous section, it is clear that comprehensive exploration is vital to avoid developing mines under geological conditions that are fundamentally uneconomic. The exploration process involves moving from a general description of the resource to an accurate assessment of how much coal can be provided to the marketplace.

Identified coal resources are the potentially useable resources in a defined area. Such resources could be mined to give an acceptable quality for commercial use in the foreseeable future. Minor coal occurrences are excluded.

Identification is based on points of geological observation and extrapolations from those points. A geological point of observation is a sample of a coal-bearing strata which provides information on that strata by observation, measurement and testing of surface or underground exposures, core samples, cuttings and/or non-cored boreholes. Geophysical techniques such as seismic surveys can increase confidence regarding the continuity of seams between points of observation. Closer spacing of observation points may be required in the presence of faulting, intrusion and seam splitting.

Various categories of resource exist depending on the level of confidence in the resource assessment.

- *Inferred resources* are where the presence of coal has been unambiguously determined. However, no detailed samples or measurements have been taken.
- *Indicated resources* are where exploration has allowed a reliable estimate of coal thickness, quality, depth and in-situ tonnage.
- *Measured resources* are computed from similar information to that used to calculate indicated resources. However, the degree of assurance is higher than for indicated resources.

Indicated and measured resources are known collectively as *demonstrated resources* or *demonstrated economic resources*. Figure B.2 shows how resources are categorised by increasing levels of exploration. Australia's resources are described in Attachment C1.

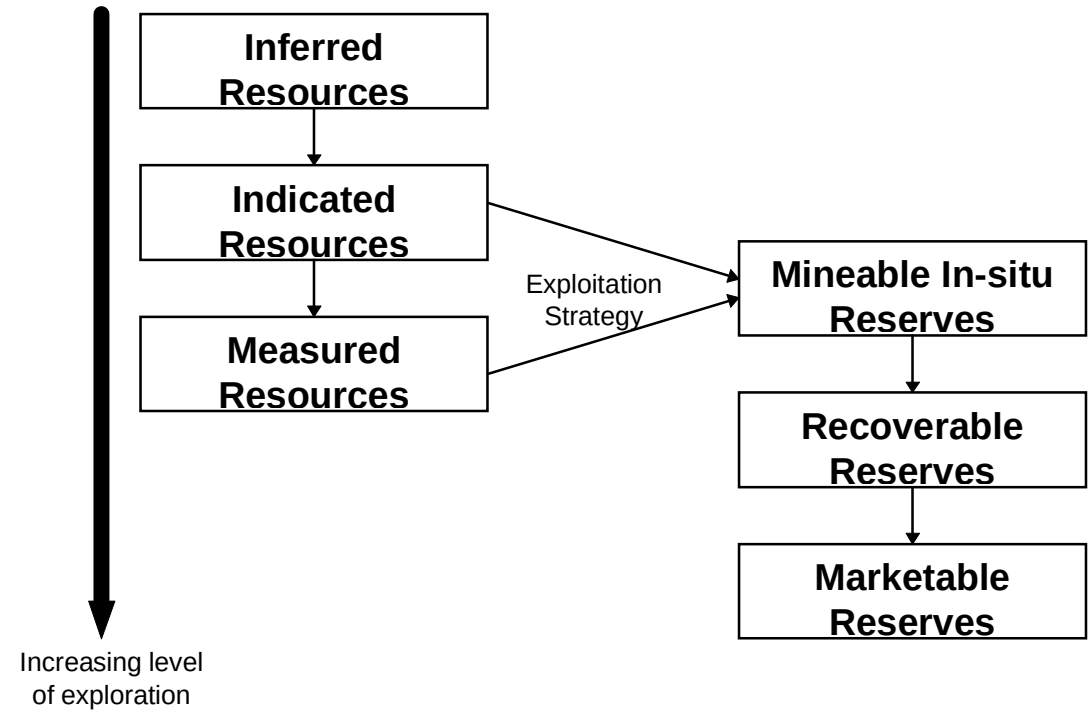
Once the resource has been identified, sufficient information is gathered to enable exploitation including detailed or conceptual mine planning. Coal reserves are those parts of the coal resource for which such planning has been undertaken. Again, various categories of reserves exist depending on the level of assessment.

Mineable in-situ reserves are the tonnages of coal contained in seams or sections of seams for which sufficient information is available for which conceptual mine planning has been undertaken and an outline of the proposed mining method has been provided. Mineable in-situ reserves exclude coal in locations where mining is prohibited — for example, within Australian national parks.

Once mine planning is complete, the proportion of seams to be extracted is calculated. This provides the tonnage of recoverable reserves from the mineable in-situ reserves. This is also known as run-of-mine tonnage. The type of mining to be used will determine what recovery factor is applied to calculate recoverable reserves. For example, an open cut mine may recover 90 per cent of mineable in-situ reserves, while an underground mine may recover 50 per cent of mineable in-situ reserves.

Marketable reserves are the tonnages of coal that will be available for sale. If the coal is to be sold raw then marketable reserves will be the same as recoverable reserves. However, this is generally a lower estimate of reserves than recoverable reserves as the calculation of marketable reserves involves making allowance for removing the impurities in the recoverable reserves. This process of upgrading the coal is known as beneficiation.

Figure B.2: **Categories of coal resources by level of exploration**



Source: QCB (1997).

B.3 Coal mining

Coal is produced from two distinct types of mines; surface (open cut) and underground. Generally, coal more than 70 metres below the surface is mined by underground methods. Coal nearer to the surface is mined by surface mining techniques.

As technology changes, the line between viable surface and underground mines is becoming less well defined. Furthermore, with the advent of new technology, both surface and underground mines are increasingly mechanised. In turn, miners are becoming skilled in the new technologies.

B.3.1 Surface mining techniques

In general, surface mining is the cheapest and most productive method of mining coal. Surface mining techniques can extract up to 95 per cent of the coal in a particular deposit. Surface mines exist in three general situations:

- area mines — where the terrain is flat, or gently undulating, and the coal seam or seams are at a relatively constant depth;
- contour mines — which most often exist where the terrain is undulating and a number of coal seams exist interspersed with other strata; and
- mountain removal — where coal-bearing strata exist near the top of large hills or mountains. In this case the entire mountain may be excavated to obtain the coal.

Open cut strip mining

In Australia, open cut mining accounts for over 70 per cent of production. In the United States, open cut mining accounts for about 60 per cent of production.

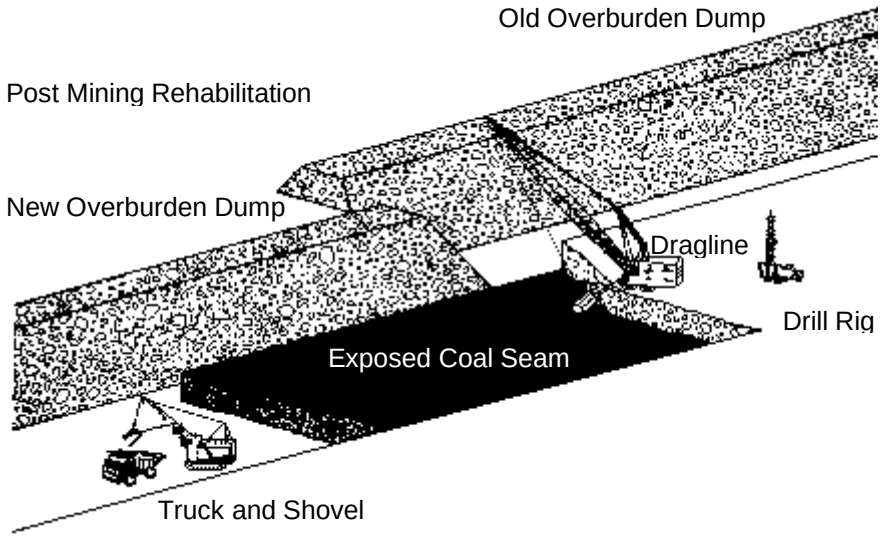
Large open cut strip mines can be a number of kilometres long and up to a kilometre wide. Most open cut mines follow a broadly similar model, although the precise technology applied varies considerably.

The first process is generally referred to as the pre-strip. Bulldozers and scrapers are used to remove the existing vegetation and to roughly level the surface. Top soil is stripped and stockpiled for use in rehabilitation works, after mining is completed. Holes are then drilled in the overburden and explosive charges set and fired. This weakens the overburden for easier removal in the next process.

Overburden removal (stripping) is carried out by a number of methods, including dragline, excavator, shovel, or bucket wheel, depending on overburden depth and the precise characteristics of the mine. Removing the

overburden exposes the coal seam below. When exposed, the coal seam can be mined by wheel loaders and trucks or other combinations of plant. Again, this can involve drilling and blasting to loosen the coal seam for extraction. Figure B.3 shows a profile of a typical open cut strip mining operation.

Figure B.3: **Open cut strip mining, typical cross section**



Source: United Mine Workers of America (1997).

Highwall

This technique may be adopted in the latter stages of area mines or contour mines. It is used to recover additional resources that cannot be extracted economically by further surface mining. A remote-controlled auger or continuous miner is bored into the exposed coal seam in the highwall of an open cut and extracts coal on to a conveyor system. Highwall techniques are used occasionally in Australian open cut mines to extract residual coal reserves. Mines currently using or planning highwall mining include Ulan, Oaky Creek and Liddell.

B.3.2 Underground mining techniques

Bord and Pillar

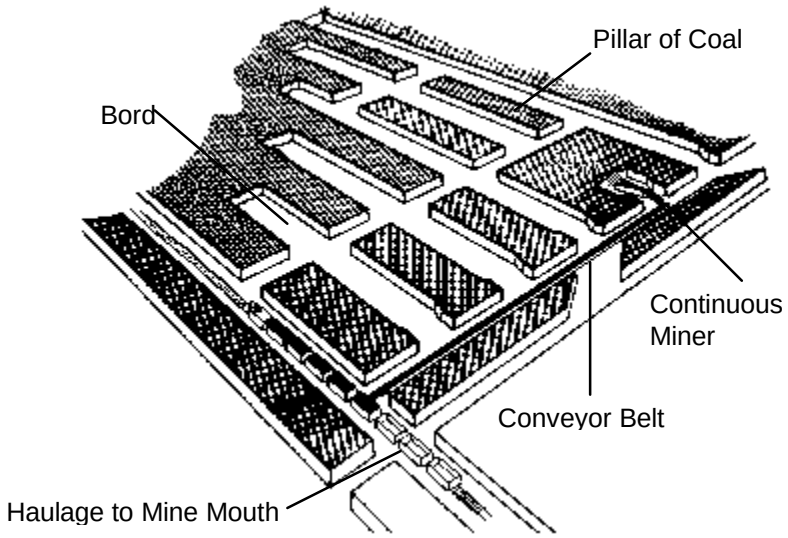
Traditionally, the underground mining of coal used the bord and pillar method (room and pillar in the US). However, this method is viewed by some mine operators as uncompetitive and is becoming obsolete in the face of newer techniques, such as longwalls. It is still used where the geology is unsuitable for

longwall mining and a number of bord and pillar mines operate throughout Australia.

This system involves the excavation of a series of rooms or bords directly into the coal seam. The roofs and ribs (walls) of access tunnels are bolted to increase their strength. In the advance phase, pillars of coal are left to help support the roof of the mine. In the retreat phase, these pillars can be removed to increase the total amount of coal extracted. As the pillars are removed, the roof is allowed to collapse and mined areas are sealed off. In Australia, the extraction of pillars is almost always mechanised.

The technique utilises machines known as continuous miners to cut coal from the working face using a revolving drum covered in hardened teeth or picks. The picks are positioned or laced on the drum concentrically, such that the coal is worked towards the centre of the miner, gathered up by gathering arms and conveyed through the body of the miner to conveyor belts linked to the surface. Alternately, coal is loaded into shuttle cars to be transported to the mine opening. Figure B.4 shows the basic processes involved in bord and pillar mining.

Figure B.4: **Bord and pillar mining**



Source: United Mine Workers of America (1997).

Longwall mining

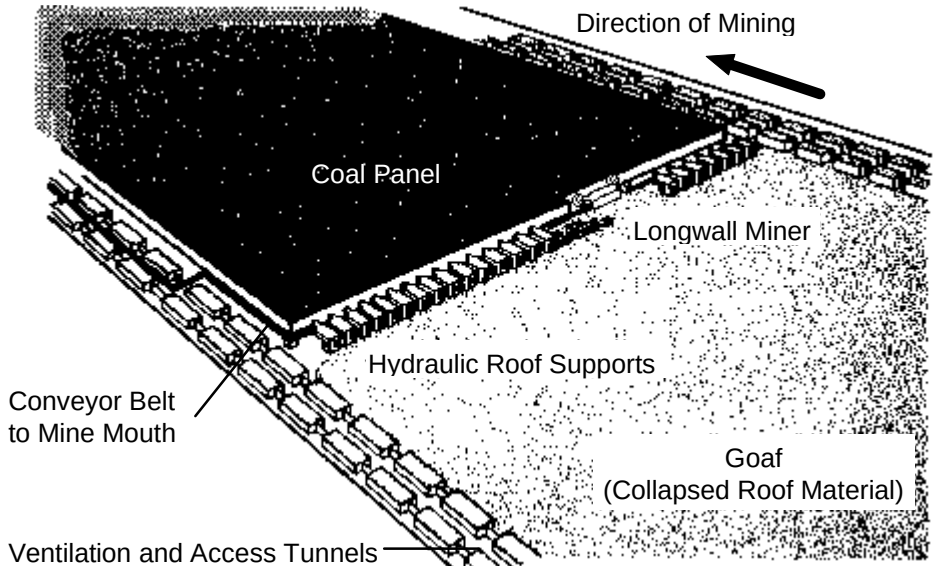
In longwall mines, continuous mining machines are used in development work on roads and ventilation tunnels. A longwall mining unit is employed to extract the bulk of the coal.

Two parallel access roads are developed directly into the coal seam from a central access system using a continuous miner. The two entries, which can be up to 200 metres apart, are then joined by a crosscut tunnel at their far ends. The face that is formed by this crosscut is referred to as the longwall. A longwall mining machine is installed in the crosscut. This machine has a rotating shearer laced with picks, which moves laterally and vertically shearing the coal from the face. The pick lacing works the coal off the face on to a conveyor belt in a single operation and allows the coal to be extracted continuously from the face and transported to the surface by conveyor.

Longwall systems generally have their own self-advancing hydraulic roof supports. As the machine advances and mining proceeds, the roof is allowed to fall behind the advancing machine. This fallen roof material is referred to as goaf and may contain both coal and other material in varying amounts. It can be explosive if not ventilated or sealed.

Longwall mining is the most productive method of underground mining in the absence of major geological complications. It is capital-intensive and the approach of individual mines can vary considerably even although they adopt the same general techniques. Figure B.5 shows views of a longwall machine from the side and from above.

Figure B.5: **Longwall mining**



Source: United Mine Workers of America (1997).

Continuous mining

Although there are a number of mines operating in Australia using the continuous mining method, most continuous miners are only one element in the total underground mining approach. Typically, continuous mining machines are used in development work on roads and ventilation tunnels, prior to the use of a different technique for extracting the coal.

Shortwall or miniwall mining

The shortwall technique is not widely used in Australia. It involves the use of continuous miners to shear coal from relatively small panels 40 to 60 metres wide. The continuous miner is protected from roof collapse by movable roof supports called jacks (chocks) as it moves through the coal seam. Coal is removed from the working face area by shuttle cars or by conveyor belt.

Conventional mining

Conventional mining, where coal panels are cut and then blasted from the seam, has disappeared from Australian mines. This method was extremely labour-intensive and was regarded as less productive and more dangerous than other methods of underground mining.

B.4 Physical and chemical characteristics of coal

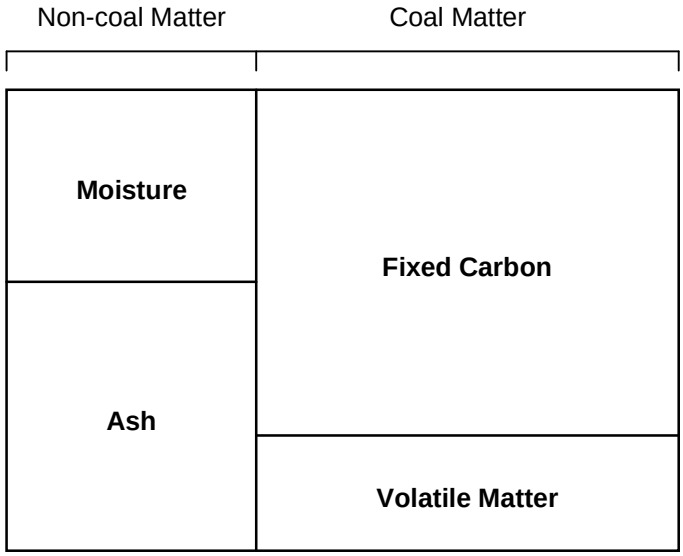
There are many types of coals. They can be distinguished by their physical and chemical characteristics. These characteristics determine the suitability of coal for various uses.

Coal is mainly composed of carbon (see Figure B.6). Coal also generates volatile matter when heated to decomposition temperatures. In addition, coal contains moisture and ash-forming mineral matter. The elements of carbon, hydrogen, nitrogen, sulphur and oxygen are present in the coal matter. The combination of these elements and the shares of volatile matter, ash and water vary considerably from coal to coal. It is the fixed carbon content and associated volatile matter of coal that control its energy value and coking properties and make it a valuable mineral on world markets.

Generally:

- *fixed carbon content* influences the energy content of the coal. The higher the fixed carbon content, the higher the energy content of the coal;

Figure B.6: **Analysis of coal**



- *volatile matter* is the proportion of the air-dried coal sample that is released in the form of gas during a standardised heating test. Volatile matter is a positive feature for thermal coal but can be a negative feature for coking coal;
- *ash* is the residue remaining after complete combustion of all organic coal matter and decomposition of the mineral matter present in the coal. The higher the ash content the lower the quality of the coal. High ash content means a lower calorific value (or energy content per tonne of coal) and increased transport costs. Most export coal is washed to reduce the ash yield (beneficiation) and ensure a consistent quality.
- *moisture content* refers to the amount of water present in the coal. Transport costs increase directly with moisture content. Excess moisture can be removed after beneficiation in preparation plants but this also increases handling costs; and
- *sulphur content* increases operating and maintenance costs of end users. High amounts of sulphur cause corrosion and the emission of sulphur dioxide for both steel producers and power plants. Low sulphur coal makes installation of desulphurisation equipment to meet emission regulations unnecessary. Southern hemisphere coals generally have a low sulphur content relative to Northern hemisphere coals.

In the ranking system discussed below, higher rank coals have lower levels of moisture and volatile matter. Higher rank coals also tend to have higher fixed carbon content and energy content.

Other coal properties, such as grindability, vitrinite reflectance and the crucible swelling number are also important when assessing quality. Generally, higher rank coals have better coking qualities. Coking coals are less plentiful than thermal coals and receive a higher price.

B.4.1 Classification of coals

International classification

As coal resources are widely distributed and traded, many national systems have been proposed for the classification of coals. The various national classification systems have proved useful for categorising each country's coal resources and comparing imported coals of similar geological age and rank. Rank measures the amount of coalification, or alteration, the mineral has undergone in its formation. Coal is subjected to consecutive and continuous stages in evolution, from lignite (brown coal), to sub-bituminous, bituminous and finally anthracite. Coal evolves through these ranks as increases in temperature and pressure decrease the water content and increase the carbon content. Sub-bituminous coal, bituminous coal and anthracite are known collectively as black coal.

In the absence of a widely accepted international coal classification system, there is a tendency in many countries to use the American Society for Testing and Materials (ASTM) classification of coals by rank. Table B.1 shows the four major ranks of coal as defined under the ASTM system. However, this classification system was developed for North American coals which consist predominantly of vitrinite. It is frequently used incorrectly to classify coals where vitrinite contents are low such as Australian bituminous coals.

Table B.1: **Classification of coals by rank, ASTM system**

Class	*Fixed Carbon*		*Volatile Matter*		*Energy*
	Dry	*Moist*	*Dry*	*Moist*	*Moist*
	%	*%*	*%*	*%*	*MJ/kg*
I. Anthracite	> 98–86	> 92–81	< 2–14	< 2–15	35.5–31.4
II. Bituminous	86–54	81–45	14–57	13–40	35.8–24.4
III. Sub-bituminous	55–53	45-37	53–55	36–38	26.7–19.3
IV. Lignite (brown coal)	52	32–26	32–35	38–50	< 19.3

The development of a single simple classification of coals which is unambiguously applicable to all coals world wide and acceptable to the international coal industry remains an unresolved challenge. The International

Standards Organisation is currently attempting the development of an ISO classification system which, while simple, is based on enough key parameters to provide a useful basis for the classification of coal resources of all ranks worldwide (sub. 56, pp. 1–2).

Australian classification

Classification of Australian coals is covered by Australian Standard AS2096 (1987). It has recently been revised and the new standard classifies coals into two broad rank ranges, as follows:

Higher rank if both of the following criteria are satisfied;

- gross specific energy on an ash-free, moist (afm) basis of 21.00 MJ/kg or greater.
- gross specific energy on a dry, ash-free (daf) basis of 27.00 MJ/kg or greater.

Lower rank if either of the criteria is not satisfied.

AS2096 also allows for the quantitative definitions of the ASTM system.

B.4.2 Types of coal

Coking coals

Some types of coal when heated in large ovens, which are sealed to exclude excess air to prevent complete combustion, produce coke and gases. These coals are also known as metallurgical coals.

Coke is a porous solid composed mainly of carbon and ash. It is used in blast furnaces to produce iron and steel. It is also used as a reductant in the refining of other metals such as aluminium. A reductant allows a chemical reaction which separates the metal from its ore.

Other coking coals are used to obtain organic chemicals from the by-products of the coke and gas. These products include fuel gas, tar, benzol, toluol, xylene, and sulphate of ammonia. They are then used to produce dyes, disinfectants, explosives, drugs, synthetic fibres, acetylene, plastics and resins.

Coke quality is related positively to *coke strength*. For the purposes of blast furnace applications, the coal used must be able to form large angular coke that retains its form despite constant heat, pressure, abrasion and collision in the blast furnace. Coking coals are classified as hard, soft or semi-soft.

Hard coking coals, the highest quality coking coal, tend to have moderate volatile matter content, low inherent moisture, low ash and low sulphur levels. Hard coking coals command the highest prices in world markets.

Soft and semi-soft coking coals have a lower fixed carbon content and higher levels of inherent moisture and volatile matter than hard coking coals.

Thermal coal

The major use of black coal is for fuel for thermal power stations. It is pulverised and burnt in steam generating boilers. The steam is then used for the generation of electricity. Thermal coal is also known as energy or steaming coal.

The higher the levels of ash, moisture, and sulphur, the lower the quality of the thermal coal. The lower the quality, the lower the price received on world markets. Much of the world's thermal coal is not of sufficient standard to be traded and its use is restricted to co-located power stations.

Also classified as thermal coals, pulverised coal injection (PCI) coals are used as a supplementary fuel injection into modern blast furnaces to increase the productivity of the coke used in the furnace. PCI coals have low levels of inherent moisture and ash but high levels of volatile matter. However, specifications vary greatly.

Australian thermal coal generally has high energy content (calorific value) and low levels of sulphur, phosphorus and heavy metals.

Washing allows thermal coal to be turned into semi-soft coking coal by reducing the ash content.

C THE AUSTRALIAN BLACK COAL INDUSTRY

This appendix provides a short description of the Australian black coal industry, outlining its importance to the Australian economy, production, domestic consumption and exports. It also discusses characteristics of the black coal labour force. Attachment C1 describes Australia's black coal resources and mining areas.

C.1 History of black coal mining in Australia

Black coal was first mined in the Newcastle area in 1799 and commercial mining had commenced in every State by 1898. Initial development of the industry occurred under heavy government influence. This included the supply of convict labour, the encouragement of systematic coal exploration and the granting of monopoly coal mining rights to the Australian Agricultural Company between 1826 and 1847.

No new convict labour was supplied for coal mining after 1840 and paid immigrant miners from the United Kingdom became the majority of the workforce used in NSW mines. The first coal mining unions were formed in the 1850s as immigrant miners and managers introduced practices and culture similar to that found in England and Wales.

A high level of industrial disputation soon became associated with the industry. Strikes, which occurred regularly after 1860, were often about increased pay and conditions, mine safety or the introduction of new work practices and mining technology which had been improving steadily in the late 1800s.

This gave rise to a history of government regulation through a series of tribunals, commissions and special commissioners which culminated in the formation of the Joint Coal Board (JCB) and Coal Industry Tribunal (CIT) in 1946.

Black coal production reached over 13 million tonnes (Mt) in the mid-1920s with exports reaching one million tonnes per year. The NSW coalfields around Newcastle, Illawarra and along the Hunter Valley dominated production. However, until 1949, the general industrial turmoil evident in the industry damaged production and exports.

The Great Depression and the substitution of petroleum products for coal in industry compounded these problems and the industry began to decline. By the

1950s the black coal industry had suffered further loss of market share due to competition from fuel oil and had become domestically focused. The JCB oversaw rationalisation of the industry which resulted in the closure of many small mines and a large reduction in employee numbers. The CIT's settlement of the 1949 strike brought relative peace to the industry for the next twenty years.

The reconstruction of Japan after the Second World War and its rapid industrialisation led to the development of the large near surface seams of the Bowen Basin in Queensland. Large open cut mines were opened along a 250 km strike length to supply the Japanese steel industry with high quality coking coal. Exports to Japan began in 1959 and had reached almost 20 Mt a year by 1970.

The 1970s oil price shocks created large export markets for Australia's thermal coal in Europe and Asia. Industrialisation of East Asia also provided new markets for Australia's coking coal.

As industry profitability increased as a result of sharply higher prices after the late 1970s, unions launched campaigns for higher wages and the level of industrial disputes increased to an all time high in 1980.

The 1980s also saw the widespread introduction of less labour-intensive longwall mining technology in underground mines. Underground production increased as a result, but employment fell in NSW, where most underground mines were located.

Australian coal exports increased rapidly during this period. In 1985, Australia exported 88 Mt of coking and thermal coal to become the world's largest exporter of black coal, a position it has held since.

In 1950, underground mines accounted for almost all Australian black coal production. However, by 1997, underground mines accounted for less than 30 per cent of Australian black coal production. This change reflected the development of export-focused, open cut mines, particularly in the Hunter Valley in NSW and the Bowen Basin in Queensland.

C.2 The domestic industry

The Australian black coal industry encompasses a range of businesses. In addition to coal mining itself, there are significant processing, transport and support services related to the industry. The industry also has extensive linkages with international and domestic power utilities and steel industries.

In 1995–96, the black coal industry contributed 33 per cent of the turnover, 45 per cent of the total employment and 23 per cent of the total value of exports of the Australian mining sector which includes iron ore, oil and natural gas, gold, aluminium etc. Value added from the black coal industry totalled $5 billion, equivalent to over 1 per cent of Australia's GDP (see Table C.1).

Table C.1: **Size of the coal industry and mining sector relative to the Australian economy, 1995–96**

		Black coal industry	*Mining sector*	*Australia*
Turnover	($b)	10	30	na
Value added	($b)	5	19	489
Exports	($b)	8	34	98
Employment	('000)	25	56	8 300

na Not available.

Source: ABS (Cat. No. 5368.0, Cat. No. 8401.0 and Cat. No. 6202.0).

Australian coal mines have diverse ownership structures. Owners include government business enterprises, publicly listed companies and private firms. There is significant foreign ownership and vertical integration; in addition to specialist mining companies, various large steel producers, international trading houses and power utilities own or have an equity interest in mines. It is also common for an owner to employ another company to manage its mining operations and employ contractors for the extraction of the resource.

There were 118 black coal mines operating in Australia at the end of 1997. This included 58 underground mines and 60 open cut mines. They varied in size from the Goonyella/Riverside open cut mine, which produced over 11 Mt of saleable coal, to the relatively small Burgowan No. 12 operation, which produced under 8 thousand tonnes of saleable coal. Sixty nine mines operated in NSW, 42 in Queensland and seven in other States (JCB and QCB 1998).

C.2.1 Production

Australian production of black coal was concentrated in NSW until the development of large export mines in Queensland in the 1960s. By 1990, Queensland and NSW were producing roughly equal amounts of black coal.

Australian production increased rapidly from the late 1970s. Production for export exceeded production for domestic use in 1976, and has since increased steadily to account for 72 per cent of total production in 1997.

Production from underground mining also increased as longwall miners replaced the older methods of underground extraction during the 1980s.

In 1997, Australia's production of saleable black coal was 217 Mt, an increase of over 180 per cent since 1980. This growth has been shared evenly between NSW and Queensland, which accounted for 48 per cent and 47 per cent, respectively, of Australian black coal production. Table C.2 shows production by State and mine type between 1970 and 1997.

Table C.2: **Saleable coal production by State and mine type** (Mt)

Year	*Underground*			*Open cut*			***Total***
	NSW	*Qld*	*Total*[a]	*NSW*	*Qld*	*Total*[a]	***Australia***
1970	na	na	33	na	na	12	**45**
1975	na	na	30	na	na	31	**61**
1980	31	3	35	12	26	42	**77**
1985	39	4	44	23	57	85	**129**
1986	41	4	46	25	62	93	**139**
1987	44	4	49	26	65	96	**145**
1988	39	4	44	27	65	97	**141**
1989	43	4	49	30	70	106	**155**
1990	46	6	53	33	71	110	**163**
1991	46	7	54	35	72	114	**168**
1992	44	9	54	41	78	126	**180**
1993	43	9	54	42	77	126	**180**
1994	42	11	54	44	78	130	**184**
1995	45	12	57	45	82	136	**193**
1996	47	11	59	47	84	140	**199**
1997	49	14	63	56	89	154	**217**

a Includes other States' production.
na Not available.
Sources: JCB and QCB (various).

Mining is heavily concentrated in two regions in Australia. The Sydney Basin in NSW and the Bowen Basin in Queensland account for the vast majority of Australia's production and exports of black coal. Therefore, the effects on employment of expansion or contraction of the industry have been heavily regionalised.

Four companies controlled mines that produced over 54 per cent of saleable production in 1997. However, there are many small producers. The top seven producers are shown in Table C.3.

Table C.3: **Leading Australian black coal producers, 1997**

Company[a]	*Saleable production*[b]	*Percentage of total*
	Mt	*%*
BHP	54.6	25.2
Rio Tinto	30.3	13.9
Shell	18.2	8.4
Oakbridge	14.9	6.8
MIM	10.7	4.9
Peabody Resources	10.1	4.7
Powercoal	8.8	4.0
Other	69.6	32.1
Total	**216.9**	**100.0**

a Production from a mine is credited to a company where it has control or the majority shareholding in a joint venture. For example, Shell owns 82 per cent of the Dartbrook mine, so all production from Dartbrook is credited to Shell.

b Data are preliminary and may be subject to revision. Columns may not add up due to rounding error.

Source: JCB and QCB (1998).

C.2.2 Domestic consumption

The major consumers of black coal in the domestic market are the steel, aluminium and cement industries and coal-fired power stations.

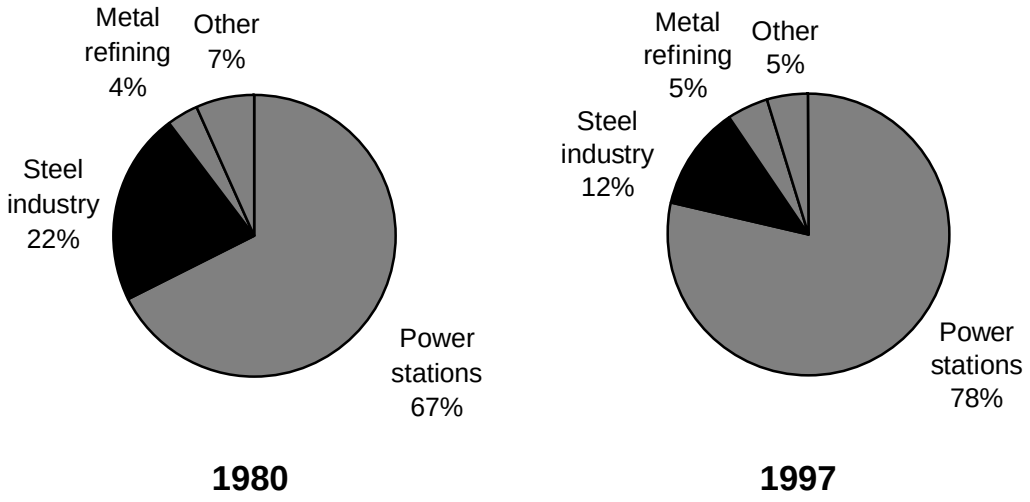
Approximately 8 per cent of coking coal production is used by the domestic steel industry. The domestic steel industry has declined in importance as a market for black coal in both absolute and relative terms between 1980 and 1997. The closure of the Newcastle steelworks in 1999 will see this trend continue (ACIL 1997b).

Over 41 per cent of Australian thermal coal production is used to supply the local power industry and other domestic industrial consumers. Black coal was used to generate 56 per cent of Australia's electricity in 1995–96 (ABARE 1997i). Many export mines use the domestic power industry to offload marginal coal that is unsuitable for export. The development of the National Electricity Market is the most important recent development for the domestic thermal coal

market. Projections of domestic demand for coking and thermal coal are provided in Appendix L, Attachment L2.

Figure C.1 shows the change in shares of domestic coal consumption for 1980 and 1997. Table C.4 shows domestic coal consumption by tonnage for major consumers between 1980 and 1997.

Figure C.1: **Domestic black coal consumption by industry**



Sources: JCB and QCB (various).

Table C.4: **Domestic black coal consumption, by consumer** (Mt)

Year	*Power stations*	*Steel industry*	*Metal refining*	*Cement industry*	*Other*	***Total***
1980	24.5	8.1	1.2	0.9	1.5	**36.4**
1985	30.7	6.3	1.9	1.0	1.9	**41.9**
1990	38.8	7.5	2.1	0.9	2.1	**51.4**
1991	39.0	7.1	2.3	0.8	2.1	**51.4**
1992	40.1	7.1	2.4	0.9	2.2	**52.7**
1993	41.5	7.2	2.7	0.8	1.6	**53.9**
1994	41.9	6.9	2.8	0.9	1.7	**54.2**
1995	44.5	7.4	2.9	0.7	1.8	**57.2**
1996	46.4	5.9	2.9	0.8	1.8	**57.9**
1997	47.2	7.1	2.9	0.9	1.9	**60.0**

Sources: JCB and QCB (various).

C.2.3 Exports

Exports of coking coal have been increasing steadily since the early 1960s. Exports of thermal coal increased dramatically in the early 1980s as a result of the 1979 oil price shock. Total black coal exports from Australia in 1997 rose to a record 157 Mt, an increase of 265 per cent since 1980. This comprised 84 Mt of coking coal and 74 Mt of thermal coal.

Queensland and NSW have produced all of Australia's black coal export shipments since 1974. Between 1980 and 1997, Queensland's exports increased by 320 per cent to 84 Mt and the tonnage from NSW increased by 222 per cent to 74 Mt. In 1997, Queensland accounted for 70 per cent of Australia's coking coal exports and 34 per cent of thermal coal exports. NSW exports accounted for the balance. Table C.5 shows exports by State and coal type between 1970 and 1997.

Table C.5: **Coal exports by type and by State** (Mt)

Year	*Coking*			*Thermal*			*Total*		
	NSW	*Qld*	*Total*	*NSW*	*Qld*	*Total*	*NSW*	*Qld*	***Aus***
1970	na	na	17	na	na	1	12	6	**18**
1975	na	na	26	na	na	3	14	15	**30**
1980	na	na	34	na	na	10	23	20	**43**
1985	na	na	50	na	na	38	41	47	**88**
1986	15	34	49	26	18	43	40	52	**92**
1987	16	39	55	27	20	47	43	59	**102**
1988	17	39	56	25	19	44	42	58	**100**
1989	17	39	56	23	20	43	40	58	**99**
1990	17	40	57	28	21	49	46	61	**107**
1991	21	44	66	32	22	54	54	67	**120**
1992	22	46	68	34	24	58	56	70	**126**
1993	24	50	74	35	23	58	59	73	**132**
1994	23	49	72	35	24	59	58	73	**131**
1995	22	52	75	38	24	62	60	77	**137**
1996	24	53	77	40	24	64	64	76	**141**
1997	25	59	84	49	25	74	74	84	**157**

na Not available.

Sources: JCB and QCB (various).

Coking coal

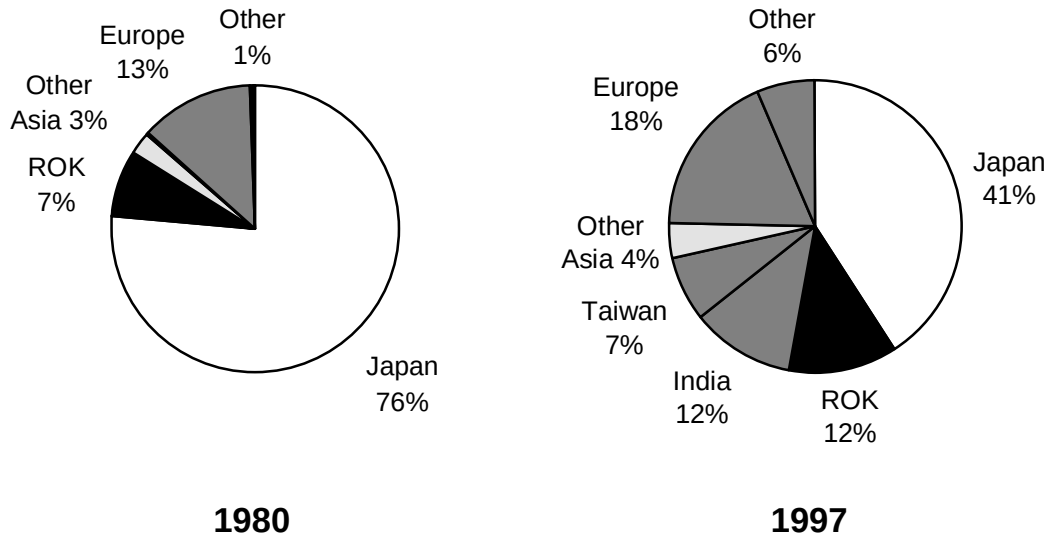
Japan has always been Australia's major market for coking coal. However, its dominance has decreased as the industrialisation of other Asian countries and the decline of the European coal industry have increased demand for Australian coking coal. Japan's share of Australia's coking coal exports has fallen from 76 per cent in 1980 to 41 per cent in 1997. Over the same period, Europe and the rest of Asia increased their shares from 13 per cent and 10 per cent to 18 per cent and 35 per cent, respectively (see Figure C.2).

Figure C.2 and Table C.6 show the changing pattern of Australia's coking coal exports between 1980 and 1997.

Thermal coal

Asia is now the destination for 91 per cent of Australia's thermal coal exports compared with 53 per cent in 1980. Japan, the Republic of Korea (ROK) and Taiwan are the major buyers of Australian thermal coal in the region. Europe's share of Australian thermal coal exports fell from 36 per cent in 1980 to 6 per cent in 1997 (see Figure C.3).

Figure C.2: **Destination of Australian coking coal exports**



a May differ from Table C.6 due to rounding error.

Sources: JCB and QCB (various).

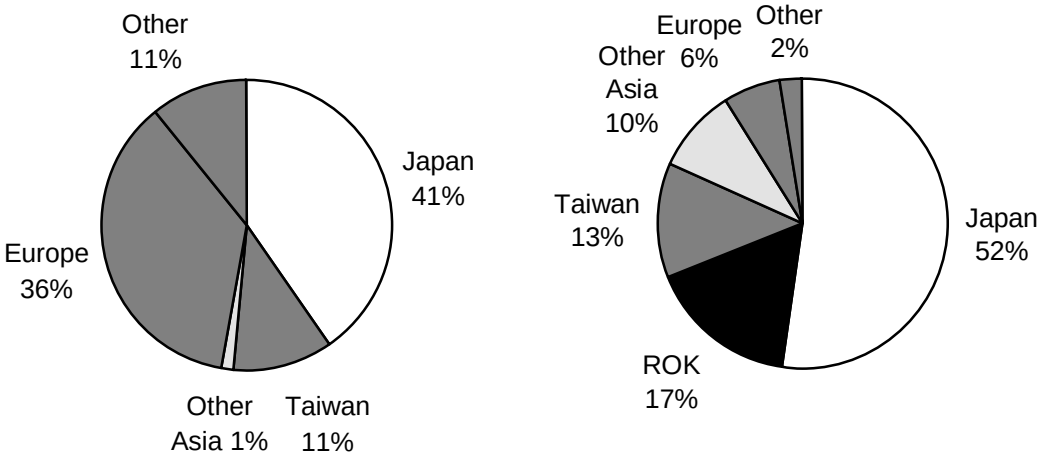
Table C.6: **Destination of Australian coking coal exports**

Country	*1980*		*1985*		*1990*		*1997*	
	Mt	*%*	*Mt*	*%*	*Mt*	*%*	*Mt*	*%*
Japan	25.6	76.4	29.3	59.2	28.3	49.6	34.1	40.7
ROK	2.2	6.8	3.1	6.2	5.1	8.9	10.0	11.9
India	0.2	0.7	2.0	4.1	4.8	8.5	9.6	11.5
Taiwan	0.8	2.5	2.0	4.0	2.8	4.9	6.0	7.2
Other Asia	0.1	0.2	1.4	2.8	3.1	5.5	3.4	4.1
Europe	4.2	12.7	9.6	19.4	10.6	18.5	15.3	18.3
Rest of World	0.2	0.7	2.1	4.3	2.3	4.1	5.3	6.3
Total	**33.4**	**100.0**	**49.4**	**100.0**	**57.1**	**100.0**	**83.7**	**100.0**

Sources: IEA (1997) and JCB and QCB (various).

Figure C.3 and Table C.7 show the changing pattern of Australia's thermal coal exports between 1980 and 1997.

Figure C.3: **Destination of Australian thermal coal exports**



a May differ from Table C.7 due to rounding error.
Sources: JCB and QCB (various).

Table C.7: **Destination of Australian thermal coal exports**

Country	*1980*		*1985*		*1990*		*1997*	
	Mt	*%*	*Mt*	*%*	*Mt*	*%*	*Mt*	*%*
Japan	3.6	40.2	15.3	38.9	27.1	54.7	38.5	52.3
ROK	0.0	0.1	5.5	13.9	3.5	7.1	12.3	16.7
Taiwan	1.0	11.1	3.8	9.6	3.0	6.2	9.4	12.8
Other Asia	0.1	1.3	4.3	11.0	6.5	13.1	6.9	9.4
Europe	3.2	36.3	8.1	20.7	9.0	18.2	4.7	6.4
Rest of World	1.0	10.8	2.3	5.9	0.4	0.7	1.8	2.4
Total	**8.9**	**100.0**	**39.3**	**100.0**	**49.5**	**100.0**	**73.6**	**100.0**

Sources: IEA (1997) and JCB and QCB (various).

C.3 Labour force characteristics

C.3.1 Employment

Since employment in the black coal industry peaked at the end of 1986 at 32 700, it has declined by 27 per cent to 23 800 at the end of 1997. The majority of employment loss was at NSW underground mines. Between 1986 and 1997, employment in NSW underground mines declined by nearly 8000 persons while employment in NSW open cut mines increased by around 700 persons. In Queensland, over the same period, employment in underground mines increased by 200 persons and employment in open cut mines declined by about 900 persons. Table C.8 presents total employment data in the black coal industry by State and mine type.

C.3.2 Wages

Black coal employee earnings are high when compared with average earnings for all industries and with employee earnings in metal ore mining industries. In 1996–97, black coal industry full-time average weekly total earnings (AWTE) were 1.4 times full-time AWTE in metal ore mining industries and two times full-time AWTE for all industries (ABS Cat. No. 6203.0 and unpublished data).

Table C.8: **Employment by State and mine type**[a] ('000 persons)

Year	*Underground*			*Open cut*			***Total***
	NSW	*Qld*	*Total*[b]	*NSW*	*Qld*	*Total*[b]	***Australia***
1980	16.3	2.3	19.7	1.5	5.4	7.9	**27.6**
1981	18.4	2.4	21.4	2.3	6.0	9.4	**30.8**
1982	17.7	2.4	20.6	3.0	6.4	10.7	**31.3**
1983	15.8	2.0	18.4	3.3	7.3	11.9	**30.3**
1984	15.0	1.9	17.7	3.6	8.0	12.9	**30.5**
1985	15.3	2.0	17.9	4.1	8.6	14.0	**31.9**
1986	15.7	1.9	18.2	4.4	8.6	14.3	**32.7**
1987	13.4	1.4	15.4	4.1	8.4	13.8	**29.1**
1988	12.4	1.4	14.4	4.2	8.1	13.6	**28.0**
1989	12.3	1.6	14.5	5.0	8.6	14.8	**29.3**
1990	12.0	1.7	14.3	5.0	9.0	15.3	**29.6**
1991	11.1	2.0	13.5	5.1	8.9	15.1	**28.6**
1992	9.9	1.8	12.2	5.1	8.9	15.2	**27.4**
1993	9.1	2.0	11.4	5.1	8.7	15.1	**26.4**
1994	9.1	2.0	11.1	4.8	8.3	14.4	**25.5**
1995	8.8	2.3	11.2	5.0	8.5	14.6	**25.8**
1996	9.0	2.3	11.4	5.3	8.4	14.8	**26.2**
1997	8.0	2.1	10.2	5.1	7.5	13.6	**23.8**

a Employment working in or about a coal mine or coal preparation plant. It includes administrative, technical and clerical staff. Also includes employees from both the mine operators and outside contractors. Employment as at December of stated year.

b Includes other States' employment.

Sources: JCB and QCB (various).

This equated to annual earnings of almost $80 000 for black coal employees, compared with $57 000 in metal ore mining and $38 000 in all industries.[1]

1 Annual earnings are calculated by averaging ABS quarterly observations of AWTE and multiplying by 52.

C.3.3 Unionisation and unions

The Australian black coal industry has a history of high levels of unionisation. Between 1986 and 1997, the unionisation rate remained above 92 per cent for the black coal industry. In comparison, the rate of unionisation among the total Australian employed labour force fell from 46 to 30 per cent over the same period (ABS unpublished data).

The Construction, Forestry, Mining and Energy Union (CFMEU) is the principal union in the black coal mining industry. The mining division of the CFMEU was formed as a result of the amalgamation of: the Miners' Federation, which covered coal face workers; the Federated Mining Mechanics' Association of Australia, which covered mechanics; and the Federated Engine Drivers' and Firemens' Association, which covered drivers of plant and equipment.

The CFMEU inherited the organisational structure of the Miners' Federation. It is organised into three branches in NSW (Northern, Western and Southern) and separate branches in Queensland and Tasmania.

Aside from the CFMEU, the Australian Collieries Staff Association (ACSA) has industrial coverage of all professional, semi-professional, and clerical employees in the coal industry. The ACSA is the second largest union in the industry after the CFMEU. Since 1992, the ACSA has had representational rights of deputies. In NSW, this jurisdiction overlaps with the State-based Colliery Officials Association which traditionally has covered deputies in NSW.

Other unions involved in the coal mining industry are the Australian Manufacturing Workers Union (AMWU), which represents fitters; and the Communications, Electrical, Electronic, Energy, Information, Postal, Plumbing and Allied Services Union of Australia (CEPU), which covers electricians.

C.3.4 Working days lost

Sick Leave

Days lost due to sick leave accounted for 40 per cent of total working days lost in the black coal industry in 1996. The absence rate among coal mining employees was 3.8 per cent, 1.2 times the mining industry average (3.3 per cent) and 1.7 times the all industries average (2.2 per cent). However,

absence rates in some other industries, such as rail transport (6.8 per cent), were much higher (ABS unpublished data).[2]

Industrial disputation

Historically, the black coal industry has had a high incidence of strikes compared with other industries. Since 1990, working days lost due to industrial disputes in the coal mining industry have averaged seven times the mining industry average and 35 times the all industries average (ABS Cat. No. 6101.0).

Workers' compensation

About 14 per cent of working days lost in the black coal industry in 1996 were as a result of workers being on workers' compensation leave. Worksafe Australia reported that for the three years from 1991–92, compensation claims in black coal mines were approximately four times the all industry average and were notably higher than in other high-risk mining industries.

C.3.5 Labour turnover

The coal industry has a low rate of labour turnover. The voluntary turnover rate, for the year ended February 1996, was 4.7 per cent for male coal mining employees while the average for employees across all industries was 9.9 per cent (ABS unpublished data).[3]

The corresponding involuntary turnover rate for the coal mining industry was also observed to be below the all industry average (4.8 per cent compared with 8.5 per cent).[3]

C.3.6 Other demographic characteristics

Table C.9 shows selected comparisons of the demographic characteristics of the black coal industry workforce and the total employed labour force.

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[2] The ABS definition of absenteeism is the hours of absence from work due to sickness and injury as a percentage of total hours actually worked by full-time employees.

[3] Voluntary turnover is defined as the number of persons who voluntarily left their job during the year as a percentage of persons who held a job during that year. Involuntary turnover is defined as the number of persons who involuntarily lost their job during the year as a percentage of persons who held a job during that year.

Table C.9: **Selected comparisons of the black coal industry workforce with the total employed labour force, 1996**

	Black coal industry	*Total employed labour force*
	%	*%*
From an English-speaking background	98	86
Born in Australia	90	76
Male	98	57
Full-time	98	75
Age		
15–34	33	44
35–44	25	26
45 and over	42	30
Education		
No post-school qualifications	46	50
Vocational training	48	24
Tertiary qualifications	6	26

Sources: ABS (Cat. No. 6101.0 and unpublished data).

C.4 Rail transport in New South Wales and Queensland

The export coal rail network is located in NSW and Queensland. This section provides an overview of the size, location and nature of the operations. Maps of the rail systems are included in Attachment C1.

New South Wales

Just over 88 per cent of black coal transported in NSW was carried in the northern corridor in 1996–97 and this share has been increasing. To cater for increases in production along the northern corridor, FreightCorp has undertaken fleet expansion and maintenance. The existing northern corridor has an achievable capacity of 66 Mt. It is anticipated that by September 1998 this will increase to 79 Mt through the purchase of 800 wagons (97 tonne capacity) to add to its existing 900 wagons (76 tonne capacity) and by using locomotives which previously were hired to National Rail. In addition, minor improvements in system performance are expected to increase capacity further to 85 Mt.

In 1996–97, FreightCorp transported 59 Mt of black coal, an increase of 11 per cent over 1995–96 and 44 per cent greater than in 1990–91.

Table C.10: **NSW coal rail corridors**

Rail corridor and corridor track length	*Location*	*Origin and destination*	*Type of operation*	*Tonnes hauled 1996–97*	*Average haul distance*
				Mt	*km*
Northern 650+ km	Hunter Valley	*Origin:* Gunnedah and Ulan coal regions *Destination:* Newcastle coal terminals, steel works and power stations	Diesel locomotives and bottom discharge wagons	50.3	106
Western and Southern 230+ km	Wollongong	*Origin:* Kandos region, South Bulli and West Cliff coal region *Destination:* Port Kembla coal terminal BHP Steel Works	Diesel/ electric locomotives and bottom discharge wagons	7.1	203

Sources: IEA (1993a) and FreightCorp.

Queensland

Queensland Rail (QR) advised the Commission that the capacity of the coal rail system would be expanded in anticipation of increased volumes of export coal (127 Mt by 2001–02). QR said:

- $1.1 billion will be invested over 5 years;
- a fleet of 2100 wagons (104 tonne capacity) is being purchased to replace the existing 71 tonne wagon fleet;
- 73 tonne wagons will be upgraded to 80 tonnes;
- additional locomotives are likely to be purchased;
- track capacity will be expanded by replacing timber sleepers with concrete sleepers and constructing new spur lines; and
- track and rolling stock will be modified to enable coal trains to increase their speed from 60 km per hour to 80 km per hour (sub. 34).

In 1996–97, QR transported 91 Mt of black coal, an increase of 3 per cent over 1995–96 and an increase of 33 per cent over 1990–91.

Table C.11: **Queensland coal rail corridors**

Rail corridor and corridor track length	*Location*	*Origin and destination*	*Type of operation*	*Tonnes hauled 1996–97*	*Average haul distance*
				Mt	*km*
Newlands 235 km	Northern Bowen Basin	*Origin:* Newlands and Collinsville region *Destination:* Abbot Point coal export terminal	Diesel locomotives, bottom discharge wagons	7.2	156
Goonyella 715 km	Central Bowen Basin	*Origin:* Oaky Creek and North Goonyella regions *Destination:* Dalrymple Bay and Hay Point coal export terminals	Electric locomotives, bottom discharge wagons (Dalrymple Bay) and tippler wagons (Hay Point)	48.9	233
Blackwater 725 km	Southern Bowen Basin	*Origin:* Gregory and South Blackwater regions *Destination:* RG Tanna and Barney Point export coal terminals and Gladstone and Stanwell Power Stations	Electric locomotives, bottom discharge wagons	23.8	316
Moura 200 km	Moura	*Origin:* Moura *Destination:* RG Tanna and Barney Point export coal terminals and Gladstone Power Station and Queensland Alumina	Diesel locomotives, bottom discharge wagons	7.6	167
West Moreton-Darling Downs 292 km	Moreton Basin	*Origin:* Moreton Basin region *Destination:* Fisherman Island coal terminal and Swanbank Power Station	Diesel locomotives, bottom discharge wagons	2.3	87

Sources: Queensland Department of Mines and Energy and sub. 12.

C1 AUSTRALIAN BLACK COAL RESOURCES AND MINES

The location and quantity of Australia's black coal resources are well established. This attachment describes the size, location and type of Australia's black coal resources and mining activity.

Black coal resources

Australia has 76 billion tonnes of demonstrated black coal resources. Queensland and NSW contain 68 billion tonnes or 90 per cent of the total. This is approximately seven per cent of world black coal resources (Commonwealth Department of Primary Industries and Energy, sub. 43, p. 1).

In addition, there are significant inferred resources in NSW, Queensland and South Australia. Table C1.1 presents Australia's identified black coal resources. Figure C1.1 shows the location Australia's major coal basins.

Table C1.1: **Identified in-situ resources of black coal, 1996** (Mt)

	Demonstrated			*Inferred*
	Underground	*Open cut*	*Total*	
NSW	20 193	13 722	33 915	Very large
Queensland	20 664	13 351	34 015	Very large
South Australia	na	na	5 789	17 980
Western Australia	na	na	1 892	2 434
Tasmania	501	25	526	na
Total	**na**	**na**	**76 137**	**Very large**

na Not available.
Sources: JCB and QCB (1997).

The amount of Australian resources accessible by open cut mining methods is large. However, in the longer term, the depletion of these resources will start to limit open cut production. This points to underground mining methods having to be utilised increasingly to maintain and expand production. The NSW Government explained:

> The majority of any future growth in NSW coal production will come from the Hunter Valley. All major open cut coal resource areas have been allocated, except

> the Mount Arthur North Tender Area and the West Scone/Castle Rocks allocation area near Muswellbrook. In the medium to long term, to maintain growth in supply from the Hunter, development of efficient underground operations will become important as large open cut deposits are depleted. (sub.26, p. 5)

The Queensland Government commented:

> Queensland has identified resources of over 35 billion tonnes of coal but this resource must be considered in terms of the coal type (coking and thermal) and the mining method of extraction. Such an examination reveals, for instance, that remaining in-situ resources of high quality coking coal amenable to open cut extraction methods are only some 1900 Mt, and that resources of high volatile thermal coals amenable to open cut mining in the Bowen Basin amount to only 850 Mt.
>
> Given that saleable coal tonnages are considerably less than in-situ figures this points to a future operating environment characterised by traditionally higher cost underground extraction methods. In the face of continued downward pressure on world coal prices, this presents a threat to the future viability of the industry. (sub. 32, p. 2, executive summary)

Major mining areas

New South Wales

The principal coal resources in NSW are located in the Sydney-Gunnedah Basin. Other large deposits occur in the Oaklands and Gloucester Basins (see Figure C1.1).

The Sydney-Gunnedah Basin is a world class deposit with a length of 450 km and a width of up to 150 km. However, above the coal seams is a thick overburden. Consequently, the coal is economically accessible only around the margins. The Sydney-Gunnedah Basin contains 90 per cent of NSW's demonstrated resources. This represents around 30 billion tonnes of black coal.

The Sydney-Gunnedah Basin has five coalfields: Hunter, Newcastle, Western, Southern and Gunnedah.

- The Hunter Coalfield contains thermal and semi-soft coking coal. Production is for the domestic and export markets. Mining is centred around Muswellbrook and Singleton.
- The Newcastle Coalfield contains thermal and semi-soft coking coal. Production is for the domestic and export markets. Mining is centred around Cessnock, Maitland, Newcastle and Lake Macquarie.

- The Western Coalfield contains thermal coal. Production is for the domestic and export markets. Mining is centred around Ulan, Kandos and Lithgow, principally by underground methods.
- The Southern Coalfield contains NSW's only hard coking coal and also contains thermal coal resources. Production is for the domestic and export markets. Mining is centred around Picton and Wollongong. All mines use underground methods.
- The Gunnedah Coalfield contains thermal coal and semi-soft coking coal. Production is for the domestic and export markets.

The Hunter Coalfield is the most important for NSW's export coal industry. The NSW Government explains:

> The Hunter Coalfield is the major coal producing area in NSW. Over 50% of the State's raw coal production, and approximately 60% of the thermal coal production, comes from the Hunter Coalfield.
>
> Expansion of export thermal coal requirements from NSW will be sourced primarily from the Hunter Coalfield for the next 20 years.
>
> Production from the Newcastle, Southern and Western Coalfields will, essentially, remain static, with any new mines in these areas largely replacing production lost from closure of older mines.
>
> Opportunities for major increases in production from the Gunnedah Coalfield do not seem likely for the next 10 years. This is due to higher freight costs and to the cost associated with developing new infrastructure to support large scale mining operations. (sub. 26, p. 6)

Figure C1.2 shows the operating coal mines in NSW.

Queensland

The majority of Queensland's export quality coal is mined in the Bowen Basin. Smaller deposits are mined in the Surat and Moreton-Ipswich Basins. Non-export coal is mined in the Callide, Tarong and Maryborough Basins (see Figure C1.1). The State contains other resources that are currently uneconomic to exploit.

The Bowen Basin is a world class coal deposit in both size and quality. Containing 27 billion tonnes of demonstrated resources, it accounts for 75 per cent of Queensland's demonstrated in-situ resources. The Bowen Basin includes all of Queensland's 12 billion tonnes of demonstrated coking coal resources.

Mines operating in Queensland are indicated in Figure C1.3.

Western Australia

The Collie Basin is Western Australia's main coal resource, consisting of over one billion tonnes of low ash, high moisture thermal coal. Mining activity is concentrated around Collie.

South Australia

Although there are extensive coal resources in South Australia, frequently associated with gas reserves, these are often at great depth. The South Australian Department of Primary Industries and Resources explains:

> The black coal resources of South Australia are immense in tonnage terms (in situ resources exceed 23 billion tonnes) ...
>
> Large resources of generally high moisture, medium ash, variable (low to high) sulphur thermal coals exist in several deposits in the Arckaringa Basin ... and at Leigh Creek. (sub. 46, p. 4)

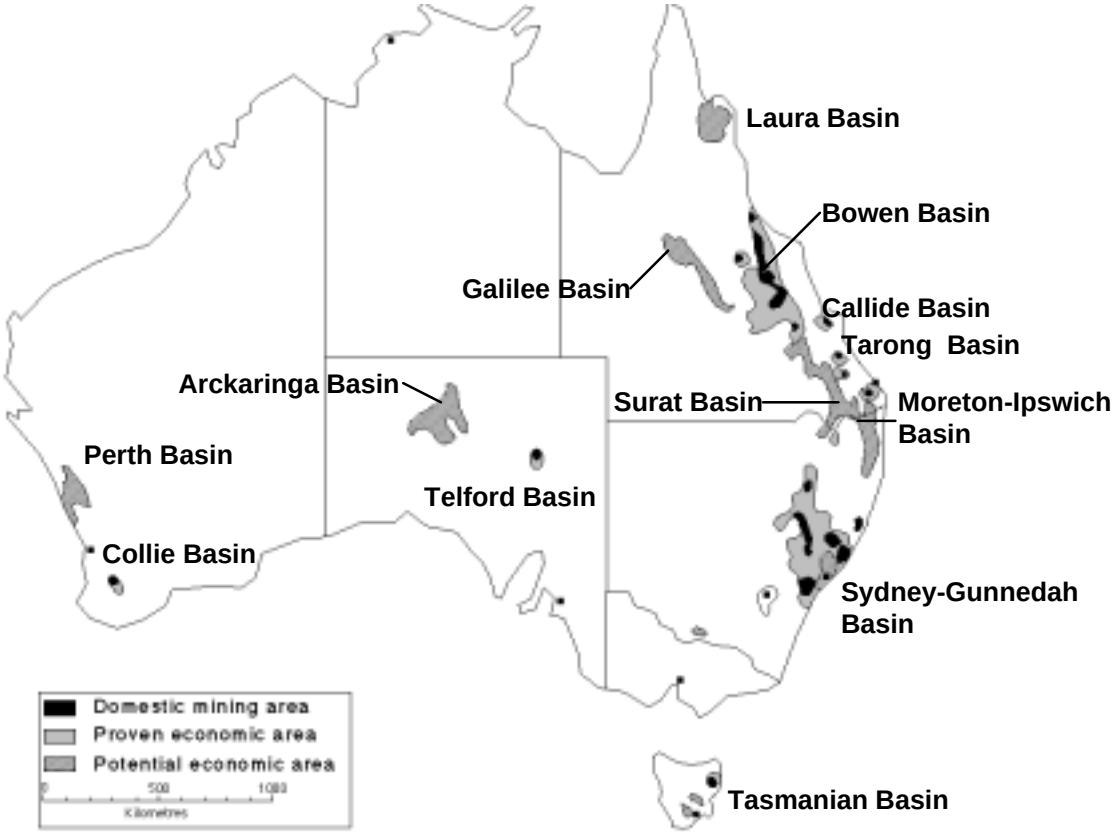
In the Telford Basin, thermal coal exists relatively close to the surface. It is mined by open cut techniques at Leigh Creek for domestic power generation.

Plans exist to exploit coal resources in the Arckaringa Basin for pig iron production as part of the South Australian Steel and Energy project proposal (sub. 46, p. 11).

Tasmania

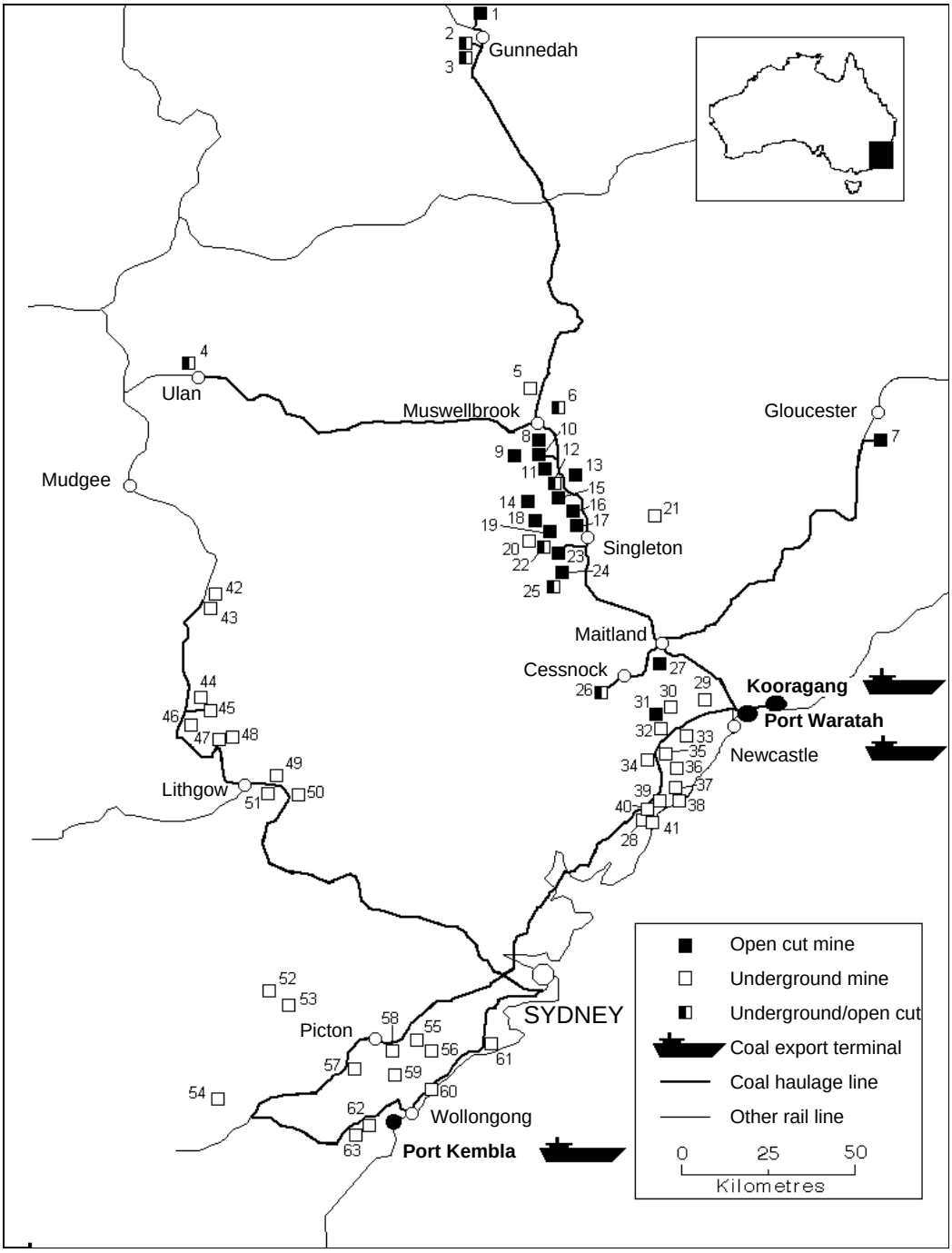
Black coal occurs in the Tasmanian Basin in the Fingal Valley. Demonstrated in-situ resources are 530 Mt of thermal coal with high ash and low sulphur content. The coal mining industry in Tasmania is focused on domestic supply only.

Figure C1.1: **Australia's major coal basins**



Source: Department of Primary Industries and Energy internet site.

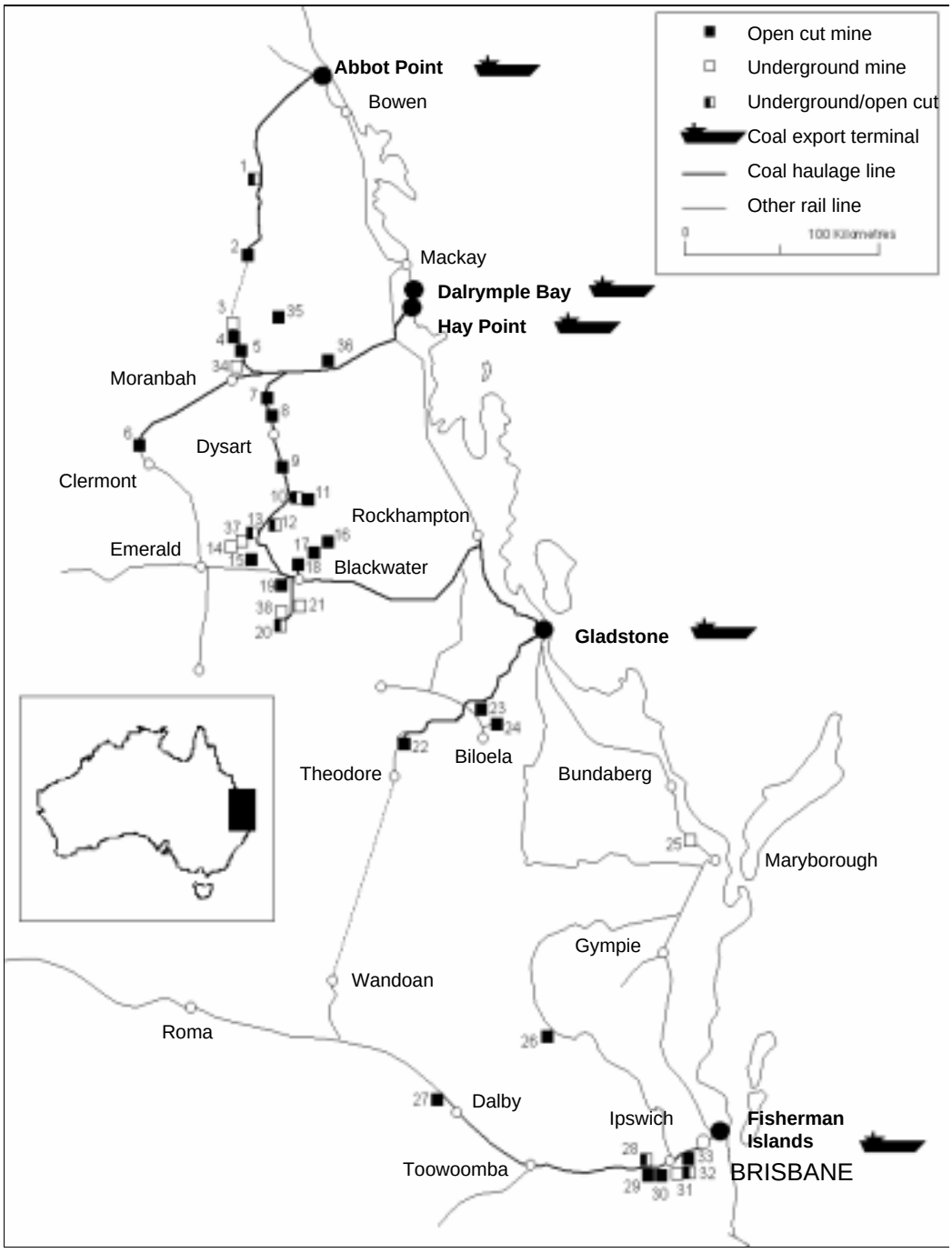
Figure C1.2: **NSW coal mines**[a]



a Mines operating in 1996–97. Mines may have opened, closed or changed mining method subsequently.

Source: Joint Coal Board.

Figure C1.3: **Queensland coal mines**[a]



a Mines operating in 1996–97. Mines may have opened, closed or changed mining method subsequently.

Source: Queensland Coal Board.

NSW mines

1	Vickery	23	Warkworth No. 1	45	Invincible
2	Gunnedah	24	Mount Thorley	46	Ivanhoe No. 2
3	Preston Extended	25	Saxonvale/South Bulga	47	Springvale
4	Ulan	26	Pelton/Ellalong	48	Angus Place
5	Dartbrook	27	Bloomfield	49	Clarence
6	Muswellbrook No. 2	28	Munmorah	50	Canyon
7	Stratford	29	Gretley	51	Blue Mountains
8	Bayswater No. 2	30	West Wallsend	52	Brimstone
9	Bayswater No. 3	31	Westside	53	Oakdale
10	Drayton	32	Newstan	54	Berrima
11	Liddell	33	Teralba	55	Appin
12	Cumnock No. 1	34	Cooranbong	56	West Cliff
13	Mount Owen	35	Awaba	57	Tahmoor
14	Howick	36	Myuna	58	Tower
15	Ravensworth/Narama	37	Wallarah	59	Cordeaux
16	Camberwell	38	Moonee	60	South Bulli
17	Rixs Creek	39	Chain Valley	61	Metropolitan
18	Hunter Valley No. 1	40	Wyee	62	Elouera
19	Lemington	41	Endeavour	63	Avon
20	United	42	Kandos No. 3		
21	Great Greta	43	Charbon		
22	Wambo	44	Baal Bone		

Queensland mines

1	Collinsville	15	Ensham	29	Ebenezer
2	Newlands	16	Yarrabee	30	Jeebropilly
3	North Goonyella	17	Jellinbah East	31	New Hill
4	Riverside	18	Curragh	32	New Hope
5	Goonyella	19	Blackwater	33	Rhondda
6	Blair Athol	20	South Blackwater	34	Moranbah North
7	Peak Downs	21	Cook	35	Burton
8	Saraji	22	Moura	36	South Walker
9	Norwich Park	23	Boundary Hill	37	Crinum
10	German Creek	24	Callide	38	Kenmare
11	German Creek East	25	Burgowan		
12	Oaky Creek	26	Meandu		
13	Gregory	27	Wilkie Creek		
14	Gordonstone	28	Oakleigh		

D THE INTERNATIONAL COAL MARKET

This appendix examines the international trade in black coal. It discusses supply, demand, trade barriers and the various arrangements under which coal is sold internationally.

D.1 The coal trade

Coal's use, both as an input to the steel industry and as a source of energy, has ensured it a major role in most countries' industrialisation. Being expensive to transport and store, the majority of world black coal production has been consumed within 50 km of the mine. However, as industrialisation has spread, trade in coking and thermal coal has increased. Three recent events have had a significant impact on international coal trade.

First, the oil shocks of 1973 and 1979 increased demand for thermal coal as prices for fuel oil increased. Many nations converted power stations from oil to coal and, as a result, thermal coal became a widely traded commodity. Second, the European coal industry declined as economic resources were depleted and subsidies for domestic industries were reduced. Third, the industrialisation of Asia caused that region to become the largest destination for traded coal.

In 1996, nearly four billion tonnes of black coal were produced globally, 88 per cent being used in the country in which it was produced. Australia supplied around one third of the 479 million tonnes (Mt) of black coal which was traded in 1996.

Over 92 per cent (440 Mt) of coal traded on the international market was transported by ship (IEA, 1997).

D.2 Supply

Coal deposits are widespread and many countries have coal mining industries. Nineteen major coal deposits are expected to produce over 90 per cent of the world's black coal output between 1990 and 2010 (IEA 1993b). These coalfields are expected to produce more than 20 Mt a year until 2010 (see Figure D.1).

Figure D.1: **The World's major coal deposits**

a	Western Canada	h	Colombia/Venezuela	o	Ranigani/Jharia, India
b	Western USA	i	Donetsk, FSU	p	Kalimantan, Indonesia
c	Illinois, USA	j	Pechora, FSU	q	Bowen, Australia
d	Appalachian, USA	k	Karaganda, FSU	r	Sydney, Australia
e	East Pennine, UK	l	Ekibastuz, FSU	s	Karoo, South Africa
f	Ruhr, Germany	m	Kuznetsk, FSU		
g	Upper Silesia, Poland	n	China		

Source: IEA (1993b).

Countries with large domestic coal markets which consume the majority or all of domestic production include the United States, China and countries of the former Soviet Union (FSU). These countries contain approximately 55 per cent of the world's economically recoverable reserves. While they do not dominate the export market, they have the capacity to release excess domestic supplies to the world market in response to increasing prices. In China and the FSU countries, this capacity has been limited by infrastructure bottlenecks (see Chapter 2).

Other major suppliers to the world market are countries which have large domestic resources but consume little themselves. This group includes Australia, Indonesia, South Africa, Poland, Colombia and Canada. These countries have emerged as major suppliers of thermal coal and/or coking coal. Since 1985, Australia has been the world's largest exporter of black coal.

Table D.1 provides international production and export data for the major black coal producing nations for 1980 and 1996.

Table D.1: **World production and exports, 1980 and 1996[a]** (Mt)

Country/Region	*1980*		*1996*	
	Production	*Exports*	*Production*	*Exports*
FSU countries	553	29	308	22
Poland	193	31	138	27
Germany	94	13	53	1
UK	130	4	50	1
Czech Republic	18	7	10	7
Other Europe	57	2	28	4
Total Europe	**1 045**	**86**	**587**	**62**
Colombia	4	0	30	25
Venezuela	0	0	6	4
Other South America	7	0	5	na
Total South America	**11**	**0**	**41**	**na**
US	710	83	878	83
Canada	20	15	40	35
Other North America	3	0	2	0
Total North America	**733**	**99**	**920**	**118**
China	620	6	1 375	30
India	114	0	271	0
Indonesia	0	0	45	36
Other Asia	83	1	54	na
Total Asia	**818**	**7**	**1 745**	**na**
South Africa	115	28	208	59.5
Other Africa	5	0	8	na
Total Africa	**120**	**29**	**216**	**na**
Australia	72	43	195	139
Other Oceania	2	0	2	2
Total Oceania	**74**	**43**	**197**	**140**
World	**2 802**	**264**	**3 705**	**479**

a Preliminary figures. Totals and sub-totals may not correspond because of rounding errors.
na Not available.
Source: IEA (1997).

D.3 Demand

Economies which have no domestic coal resources, or uneconomic or low quality resources, are the major customers of coal exporters. This group includes many European countries, Brazil, Japan, the Republic of Korea (ROK), Taiwan and India.

Since the 1960s, the structure of international trade has undergone fundamental change. The decline of the European coal industry and the increasing industrialisation of Asia have provided large markets for exporters of thermal and coking coal (IEA 1997).

Freight costs have contributed to the development of two major regional coal markets (see Table D.2). Asian countries are supplied by Australia, Canada, Indonesia and China because of geographic proximity. Europe is supplied principally by the United States, South Africa, Poland and Colombia.

The link between the two regions is provided by the United States (thermal and coking coal) and South Africa (thermal coal) which can supply to both Europe and Asia (see Box 2.3 in Chapter 2). When prices are high or freight rates particularly low, other exporters, such as Australia, sell coal into both markets. (IEA 1997).

Table D.2 shows the regional nature of the black coal trade in 1996. Over 83 per cent of exported coal was destined for Europe and Asia.

Table D.2: **World exports, by destination, 1996**[a] (Mt)

	Coking coal	*Thermal coal*	*Total black coal*
Asia/Pacific	103	131	233
Europe/Mediterranean	56	110	166
North America	6	14	20
South America	15	6	21
Other	11	28	39
World	**190**	**289**	**479**

a Preliminary figures. Totals may not correspond because of rounding errors.

Source: IEA (1997).

Coking coal

Detailed data for world trade in coking coal have been collected since 1978. From that time, the volume of trade in coking coal has grown by 66 per cent, to reach 190 Mt in 1996.

The three biggest suppliers of coking coal have increased their dominance of the market over the last 15 years. In 1980, Australia, the United States and Canada supplied 68 per cent of coking coal traded internationally. By 1996, they were supplying 81 per cent.

Over this period trading patterns changed, as European and Japanese consumption of coking coal remained stable, while demand in the rest of Asia increased dramatically. In 1980, Europe accounted for 41 per cent of world coking coal imports (56 Mt), Japan for 45 per cent (62 Mt), while the rest of Asia accounted for just 5 per cent (7 Mt). By 1996 these shares had changed substantially: Europe accounted for 29 per cent of world imports (56 Mt), Japan for 34 per cent (66 Mt) and the rest of Asia for 20 per cent (37 Mt).

This shift was due to the rapid industrialisation that took place in Asia during this period. In particular, heavy industry began to migrate to Asia from Europe (IEA 1997). The ROK and Taiwan were the major Asian importers of coking coal apart from Japan.

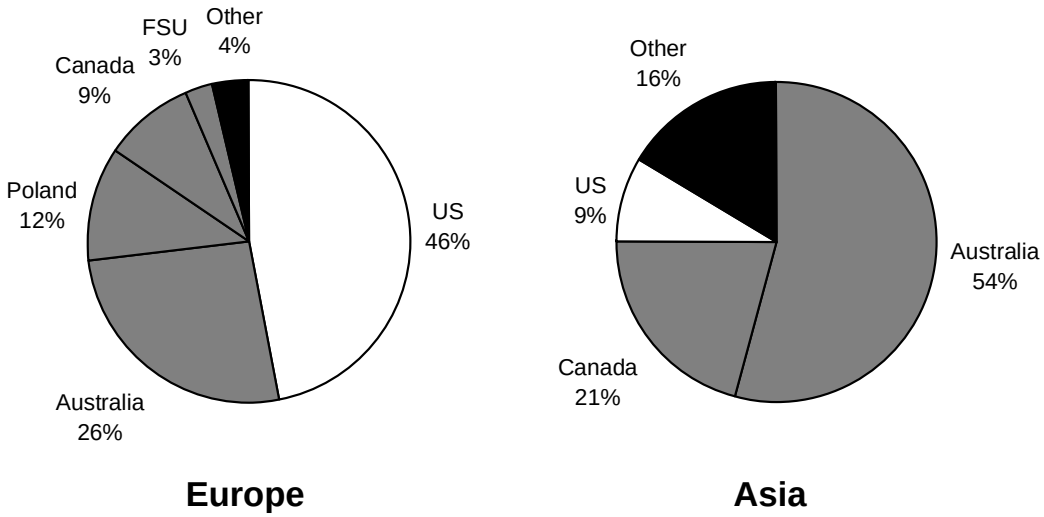
Table D.3 shows the major importers of coking coal between 1980 and 1996. Figure D.2 shows the major suppliers to these regions in 1996.

Table D.3: **Major coking coal importers** (Mt)

	1980	*1985*	*1990*	*1995*	*1996*[a]
Japan	62	69	68	65	66
ROK	4	8	10	17	18
India	1	2	5	9	11
Taiwan	0	3	4	5	6
Other Asia	2	3	8	3	2
UK	2	7	9	7	8
France	11	8	8	7	7
Italy	11	10	9	7	7
Belgium	4	5	7	5	5
Other Europe	28	31	30	28	29
Brazil	4	7	10	12	12
Canada	6	6	5	4	6
Other	1	0	4	23	14

a Preliminary figures.
Source: IEA (1997).

Figure D.2: **Exporters' shares of European and Asian coking coal markets, 1996**



Source: IEA (1997).

Thermal coal

Detailed data for world trade in thermal coal have been collected since 1978. From that time, trade in thermal coal has grown by 229 per cent — more than three times faster than trade in coking coal.

Between 1978 and 1980 imports of thermal coal into Europe increased by 50 per cent and into Asia by 174 per cent, as the 1979 oil price shock immediately affected demand. The long-term effects of the shock saw continued strong growth in thermal coal demand in both Europe and Asia.

The rise in demand has seen an increase in the number of suppliers to the world thermal coal market. In 1980, South Africa, the United States, Poland and the USSR supplied 80 per cent of the world market. In 1996, Australia was the largest exporter of thermal coal. South Africa, the United States, Indonesia and China all exported more than 20 Mt. Poland and the countries of the former Soviet Union were still major suppliers (see Figure D.3).

The rapid increase in demand from Asia has seen its share of world thermal coal imports grow from 14 per cent (16 Mt) in 1980 to 45 per cent (131 Mt) in 1996. This growth has been at the expense of Europe, whose share of thermal coal imports declined from 74 to 38 per cent. However, total tonnage imported into Europe has increased substantially from 84 Mt to 109 Mt.

Japan was the world's largest importer of thermal coal in 1996 (see Table D.4). Large amounts of thermal coal also went to the ROK, Taiwan, Germany and

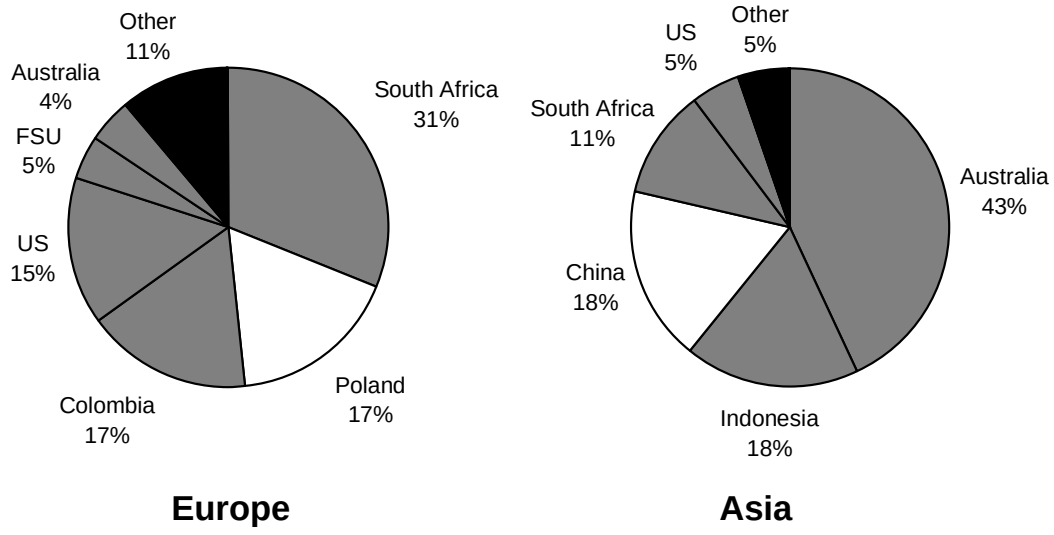
Denmark. Together these five economies accounted for over 48 per cent of world imports.

Table D.4: **Major thermal coal importers** (Mt)

	1980	*1985*	*1990*	*1995*	*1996*[a]
Japan	6	24	36	57	61
ROK	2	10	12	27	28
Taiwan	2	7	14	25	25
Other Asia	6	16	19	17	17
Germany	10	13	13	14	14
Denmark	6	10	13	13	13
Netherlands	2	4	7	12	12
Italy	3	6	12	11	10
UK	5	6	6	9	9
Spain	2	4	6	10	9
Belgium	6	5	8	9	8
Other Europe	50	54	45	37	35
Other	13	17	28	36	48

a Preliminary figures.
Source: IEA (1997).

Figure D.3: **Exporters' shares of European and Asian thermal coal markets, 1996**



Source: IEA (1997).

D.4 Trade barriers

Barriers to trade in coal are low compared with those applying to agricultural products and many manufactured goods. Most major coal importers have low or no barriers to coal imports. For example, Japan, the ROK and Taiwan, which together account for 45 per cent of world black coal imports, have tariffs below two per cent and negligible subsidies.

Nevertheless, some countries provide assistance to their domestic coal industries. This assistance reduces the size of markets available to coal exporters and was a source of concern for inquiry participants.

D.4.1 Tariffs

Tariffs on coal exist in various countries of interest to Australian exporters. In addition to uniformly applied tariffs, which reduce total coal trade, trade blocs and preferential tariffs can cause trade diversion. The Commonwealth Department of Primary Industries and Energy explained how this can damage Australia's coal exports:

> ... while uniform tariffs add to costs, they are often not discriminatory because all coal exporters to the given market will be forced to factor tariffs into their prices. Preferential tariff arrangements can be far more damaging, in that they are usually linked to membership of trade blocs, or bilateral trade arrangements ... The net result is that Australian coal exporters can be disadvantaged in, or even forced out of markets because a coal competitor has preferential access to a market. (sub. 43, p. 11)

Table D.5 provides a list of coal import tariffs, including those applying under preferential regional trade agreements.

D.4.2 Non-tariff barriers

Many countries also provide subsidies and other forms of non-tariff assistance to their domestic coal industries. In most cases, this assistance is provided to facilitate regional adjustment following industry rationalisation and market deregulation. As such, most programs are winding down and are expected to be removed by 2005. The major programs are outlined below.

Table D.5: **Tariffs on black coal imports**

Country	*Applied actual rate*[a]	*Comments*
Bulgaria	5%	Has offered to remove tariffs on coking coal to gain access to the WTO.
Hungary	4.5%	Actual tariff varies between 0 and 15% depending on type of coal and final usage.
Poland	12%	Poland has concessional duties for most other European countries.
Turkey	2.8-3%	High standard coking coal exempt.
Brazil	2%	Imports from Mercosur countries (Colombia and Venezuela) are duty free.
Chile	11%	Imports of thermal coal from Canada are duty free. Concessions are offered to Colombian coal.
Colombia	5%	Preferential tariffs for Latin American countries.
Venezuela	1%	No duty for Andean Pact countries.
Bangladesh	10%	
China	18%	Has offered to lower tariffs for all coal to 6% to gain access to WTO. Coals that are not available domestically enjoy tariff concessions.
Egypt	5%	
India	Thermal 15% (10%) Coking 8% (3%)	Base tariff rates in parentheses. In addition, duties totalling 5% were introduced in 1997 as a one-off revenue-raising measure, which will lapse automatically in early 1999.
Indonesia	5%	
Republic of Korea	1%	Temporary import duty, concessions apply.
Malaysia	5%	ASEAN members exempt from duty.
Pakistan	20%	
Papua New Guinea	11%	
Philippines	20%	ASEAN preferential tariff 13%. Tariffs to be reduced to 3% by 2000.
Thailand	1%	
Vietnam	2%	
European Union, Japan, Taiwan	none	

a Actual tariff rate currently applied to black coal imports, expressed as a percentage of fob import value.

Source: Department of Primary Industries and Energy, sub. 43, Attachment 1.

European Union

European Union Member States wishing to provide assistance to high cost coal mines must present an activity reduction plan to the European Commission. Plans are approved only if the assistance addresses social and regional problems created by the reduction in inefficient coal production. Large subsidies are paid to the French, Spanish and German coal industries. The European Commission has stated that its target is to remove these subsidies by 2005.

Approved State aid to the French coal industry was very large in 1996, amounting to 4.5 billion francs ($A1.2 billion).[1] However, the IEA (1997) stated that: "coal exploitation will cease completely in France in 2005" (p. I.165).

Spain continues to have some of the highest subsidies in Europe. Government assistance to the coal industry amounted to over $US700 million ($A1.1 billion) in 1997 and a further $US5.9 billion ($A9.5 billion) has been allocated to the industry between 1998 and 2005. Most quantitative restrictions on imports will be removed in 1998 but 15 per cent of the domestic market will be reserved for the domestic industry (compared with 40 per cent at present). The IEA (1997) noted that:

> Under a recent agreement negotiated between trade unions and the Spanish Government, [black] coal production will fall from 18 Mt in 1997 to 13 Mt in 2005. (p. I.167)

Spain's coal plan for 1998 to 2005 was approved recently by the European Commission (ICR 1998g).

In Germany, coal import quotas and the levy on electricity consumption, imposed to subsidise domestic coal purchases, were abolished in 1995. Since 1996, electricity producers have been free to choose their sources of coal supply. Subsidies now come from the federal budget. Current plans reduce subsidies from DM9.25 billion ($A8.4 billion) in 1998 to DM5.5 billion ($A5 billion) in 2005. Over that period, accumulated subsidies are expected to amount to more than DM61 billion ($A55 billion). The IEA (1997) stated that: "by 2005, about ten or eleven mines are expected to be in operation, producing about 30 Mt per year" (p. I.166). While German production should halve over the period, subsidies on a per tonne basis will remain large in 2005.

German subsidies for 1997 also were approved recently by the European Commission. However, the decision is the subject of appeal by several UK coal

[1] Exchange rates are the average of the buy/sell price as quoted on the 29 May 1998. One Australian dollar bought 62 US cents, 3.37 francs and 1.1 DM.

producers and the UK Government is seeking to block the approval of future German subsidies in the European Commission (ICR 1998g).

Eastern Europe and the Former Soviet Union

Previously under tight State control and subject to cross-subsidies and price controls, the coal industries of the former communist bloc are being restructured. While these economies maintain subsidies for their domestic industries, most are committed to non-subsidised production (IEA 1997). These subsidies are used to close non-viable mines, provide social support to unemployed miners and clean up environmental damage. Many of these economies have also removed price controls and opened their markets to imports. As inefficient mines are being closed and efficient mines are being privatised, production is falling and imports are growing (IEA 1997).

A good example of this restructuring is provided by Russia. It committed $US1.1 billion ($A1.8 billion) for subsidies in 1997. However, subsidy payments are intended to cease by 2000. The International Coal Report (1998c) reported that of the 140 mines declared non-viable in 1993, 94 had been closed by the end of 1997 leaving 46 to be closed during 1998 and 1999. No viable mines received subsidies.

Asia

Japan's two remaining mines are expected to close once subsidies are removed in 2002.

In India, price controls for coal above a calorific value of 4200 kcal/kg were removed in 1997. Other price controls will remain in force until 2000. Limited foreign investment in Indian coal companies has been allowed since 1997.

China's current five year plan for the domestic coal industry assigns $US120 million ($A190 million) for subsidies to the state coal mining sector and provides $US360 million ($A580 million) in soft loans. No subsidies are paid to private or joint venture mines (Mining Journal 1997).

D.4.3 Steel

Tariff protection and subsidies provided to industries which use coal as an input also change the pattern of coal consumption around the world. In particular, assistance to steel industries will tend to increase coking and PCI coal exports to those countries.

For example, Japan, the ROK and Taiwan, which collectively accounted for 52 per cent of 1997 Asian crude steel production, have tariffs on iron and steel

products that range from 0–8 per cent, 1–8 per cent and 0–15 per cent, respectively.

An agreement to eliminate tariffs on steel was reached during the Uruguay Round of GATT. This agreement included the major steel producers — Japan, the United States, Canada and the European Union (DFAT 1993). However, significant non-tariff barriers for steel, such as anti-dumping measures, still exist in many countries.

D.5 Sales mechanisms

There are essentially three ways in which coal is bought and sold:

- by long-term contract;
- by tender; and
- on the spot market.

D.5.1 Long-term contracts

During the 1960s, Australia began supplying coking coal to Japan through the use of long-term contracts. One of the main reasons for the development of long-term contracts for coal trade was to provide a degree of security for new mines, thereby reducing the risk incurred by financiers. These contracts also provided security for buyers as price, quality and quantity were clearly specified.

Initially, long-term contracts (for 10 to 15 years) set a base price at the completion of negotiations, which was to be escalated on the basis of cost changes, and reviewed after a set period. However, due to divergence between the 'market' price of coal (the price of equivalent coal on the spot market and under newer contracts) and the contract price during the oil price shocks of the 1970s, none of these long-term contracts maintained their base price provisions for more than a few years. Instead, annual negotiations to determine price, tonnage and quality characteristics became the norm. Often contracts included options for increasing or decreasing tonnage within a certain range.

Relationships between buyers and sellers continued virtually unchanged once the formal long-term contracts expired. For example, most Australian mines established under long-term contracts with Japanese customers continued to sell to these customers after the expiry of the contracts.

Contract arrangements were not used only for trade in the Japanese market. Other Asian buyers, especially Korean and Taiwanese buyers, also purchased

on the basis of long-term contracts with long-established suppliers and annual negotiations on price and quantity.

Benchmark pricing in the coal industry

Throughout the 1980s and early 1990s, the annual contract negotiations between Japanese buyers and their suppliers were the most significant negotiations in the market for traded coal. The prices determined in these negotiations reflected the state of demand and supply and helped to establish market prices which were reflected in other contracts and tenders.

The Japanese steel mills, operating in a coordinated manner and collectively known as the JSM, negotiated prices for coking coal. One of the steel mills would be appointed as the lead negotiator for the initial contracts with producers. Prices in subsequent contracts would be based on these 'benchmark prices', adjusted for coal quality. The Japanese power utilities (JPU) also approached their contract negotiations as a single entity, again with one or two of them chosen to represent the JPU in negotiations with thermal coal producers from a particular country.

In contrast, no similar collaboration occurred among buyers in the European coal market. With regard to contracting in the European market, ABARE (1993) said:

> In the European market, prices are negotiated between buyers and major suppliers such as companies in the United States and South Africa. There is no formal collective buying arrangement, similar to that of the JSM, in the European market. (p. 18)

However, the 'benchmark pricing system' for coking coal has broken down. The JSM's collective negotiation of prices was officially abandoned for the JFY 1997 negotiations in favour of individual negotiations with suppliers. ABARE (1997e) stated:

> For coal contract negotiations for JFY 1996, the Japanese steel mills replaced the benchmark coal price system with the 'fair treatment system' [now known as the individual negotiation method]. Under the new system, each coal company negotiates with individual steel mills over coal quality, price and quantity. (p249)

More recently, the 'benchmark pricing system' has broken down in the thermal coal market. For JFY 1998, the Japanese power utilities (JPU) have discontinued collective negotiations in favour of individual bargaining with suppliers and the issuing of tenders. The International Coal Report (1998f) explained:

> A new benchmark of sorts emerged — $34.50 basis 6,700kc GAD. ... Chubu itself is believed to be supporting a view that the new price is not a benchmark, but that

> it is a price for Chubu and that the company doesn't much bother what the rest of the industry does [Chubu was the JPU's lead negotiator with Australian suppliers].
>
> One sign that this benchmark is no such thing comes from the action of Japan's biggest coal using regional power company, Tohoku ... Tohoku has followed the Chubu settlement by calling on all its Australian suppliers to make proposals [instead of adopting the price established following Chubu's settlement]. (p19)

However, one participant argued that collective negotiations by Japanese buyers have continued informally despite the breakdown of 'benchmark pricing'. Asia Pacific Strategy stated:

> I'm very sceptical that the abandonment of benchmarking is going to cause any real change to this behavioural characteristic [forming buying cartels], it's almost a national characteristic in as far as the Japanese negotiators are concerned. They compete in their home markets but when they're dealing with a foreign supplier, they seem to naturally create a monopsony or an oligopsony. (trans.p. 166)

This view conflicts with evidence provided by participants and industry information. For example, Camberwell Coal has said that it had negotiated different prices with each of the six Japanese steel mills it supplies (sub. 13, p. 1). Likewise, the Japanese utilities Chubu, Tohoku, Chugoku, Shikoku and Hokuriku have individually invited proposals from suppliers for contract settlements for the first time and early indications suggest settled price ranges are different for each utility (Australian Coal Report 1998a, 1998b and ICR 1998f).

D.5.2 Tenders

The letting of major tenders for coal is a relatively new feature of the international coal trade. However, tenders are employed by increasing numbers of large steel makers, State-owned power utilities and the new independent power producers in the Asian region. Major thermal coal tenders include those of Taipower, the State-owned Taiwanese power utility, and Kepco, its ROK equivalent.

Generally, for an open tender, the buyer determines a detailed specification for the coal required and the criteria for evaluating tenders. Current Taipower contracts can be one to seven years in duration and are usually for around 500 000 tonnes a year. These open tenders have minimum quality specifications which are tight but not mine-specific (Taiwan Power Company, Invitation for Bid No. 87-ON-L1102). These broad specifications increase competition amongst sellers while maintaining the quality of the coal the buyer is purchasing.

D.5.3 Spot sales

In recent decades, the spot market was used by producers of both thermal and coking coal to sell coal that was surplus to contract requirements or does not meet the quality standards set in contracts. For buyers, the spot market offers generally lower prices than those negotiated under contracts. However, spot buyers take the risk that substantially higher prices may have to be paid in periods of high demand or low supply. This risk can be offset by maintaining stockpiles or developing ready access to alternatives. There is no futures market currently operating for black coal.

There are a number of types of transactions that make up what is known as the spot market. An example is Taipower's three month tenders. These consist of a three month delivery schedule of shipments (usually eight to twelve vessels of 65 000 tonnes). Suppliers bid for as many of the shipments as they desire, having to fulfil the quality specifications and delivery times. A shipment is awarded on price (Taiwan Power Company, Invitation for Bid No. TPC8103).

However, over recent years, the use of the spot market has become more widespread and is no longer a function solely of surplus coal over contract supplies. Japanese customers are now buying a greater share of their coal on the spot market or via spot tenders. The Commonwealth Department of Primary Industries and Energy made a conservative estimate of the increase in spot purchasing:

> ... about 4.4 Mt to 4.8 Mt of thermal coal [6–7 per cent of Japanese imports] is likely to be purchased by the Japanese utilities on the spot market in JFY 97, a substantial increase from about 3 Mt in JFY 96. Industry sources suggest that one major utility, Chugoku, has indicated a willingness to procure over 20% of its tonnage this way during JFY 97.(sub. 43, p. 15)

The Australian Coal Report (1998b) states that:

> Recent estimates from Japan suggest that about 8.5 Mt of thermal coal will be bought through tenders and spot purchases in JFY 1998. ... Proportionately, 19.5% of the estimated 44.0 Mt to be bought by Japanese utilities in JFY 1998 will be by this method. Last year it was 15.75%.

This trend is also apparent in other major Asian coal importers. For example, Kepco has also indicated a willingness to increase its share of spot sales. The International Coal Report (1997a) recently reported on Kepco's purchasing policies:

> Kepco, currently tendering for 600 000t, is planning regular spot tenders in 1998, possibly every month ... The company has decided to lean more heavily on spot purchases, following the very low price levels seen in recent trades.
>
> ... [These low prices] have persuaded Kepco to abandon its rigid contract-only buying policies. (p. 13)

E HISTORY OF INDUSTRIAL RELATIONS IN THE AUSTRALIAN BLACK COAL INDUSTRY

The history of industrial relations and trade unions in the black coal mining industry revolves around industrial disputation and government intervention in the form of specialist tribunals. The following summary draws heavily on the work of Martin et al (1993), Mumford (1993) and Turner (1982).

E.1 Pre-Second World War

The Newcastle convict settlement provided almost all of the initial workforce for the growth in black coal mining that occurred around Newcastle from 1799. However, convict labour was viewed as too costly and was gradually replaced by migrant miners who required less supervision. By 1847, there were few remaining convict miners. Trade unionism was imported to the NSW coal fields with the early migrant miners between 1839 and 1847. The formation of miners' clubs followed the expansion of mining. The first union emerged in 1856 at the Newcastle Coal and Copper Mine. By the 1850s, trade unionism had become a major force in the coal mining industry, with the formation of a district union in Newcastle in 1860.

The first major industrial stoppages by workers occurred in 1861 and 1862. These resulted from proprietors' attempts to form an association to lower wages. An attempt to incorporate the settlement of disputes by arbitration and wage fixation was made during the resolution of a 1873 strike.

Periods of declining market conditions tended to exacerbate the poor industrial relations climate as miners' wage claims were resisted by employers. A general strike in 1888 was marked by attacks on non-union labourers, demonstrations, arrests and prison sentences.

A Royal Commission into the 1888 strike in 1890 found that the level of disputation, as evidenced by strikes, was accentuated by the then existing arbitral systems. In response, both State and Commonwealth governments endeavoured to resolve conflict in the coal mining industry by regulating the processes of industrial relations. Provision for an arbitration court was made under *The NSW Trades Disputes Conciliation and Arbitration Act 1892*. A Federal system of conciliation and arbitration was established in 1907.

As with many attempts at regulating the industry, government arbitration was met often by the refusal of both the employers and unions to abide by rulings and the identification of legal loopholes enabling the avoidance of these rulings. The government arbitration system also failed to lower the high level of disputation and, in the years following, the level of industrial action escalated. The NSW coal industry had 26 strikes between July 1908 and August 1911, each of which was settled outside arbitration.

The Australian Coal and Shale Employees Federation, otherwise known as the Miners' Federation, was registered federally in 1913 from State-based unions. At that time, it was the dominant union in the Australian coal mining industry. By 1928, it covered an estimated 83 per cent of the industry's employees.

The first national coal mining stoppage occurred in November 1916 over demands for the eight hour day to apply to all mines across NSW. Until 1950, general industrial turmoil was evident in the black coal industry (see Section E.3).

Causes of strikes ranged from changes in work practices, due to the introduction of electricity and mechanisation (1907), to the promotion of socialisation and nationalisation (1909). The NSW Government's decision to introduce non-union labour into the Rothbury mine, during the 1929–30 strike, caused unprecedented violence, resulting in the death of one miner. Strikes resulted in large revenue losses for owners, the loss of domestic contracts and damage to the coal export trade.

E.2 The Second World War

During the Second World War, a series of legislative measures was introduced to ensure that the supply of coal needed for the war effort was delivered reliably. Coal was needed for electricity generation, gas production and steel production. The legislation failed to achieve this purpose (see Box E.1).

The Commonwealth Government appointed Davidson Commission of 1945 found that the lack of discipline that existed in the coal industry could be attributed to:

- weak and divided leadership within the Miners' Federation and antagonism between communist and non-communist mine workers;
- attempts to weaken and abolish compulsory arbitration to enable powerful unions to dictate terms to the industry, as well as the success of nearly all strikes in gaining some concessions;

- the reluctance of the Commonwealth Government to enforce existing laws against strike action and the appeasement of union demands under the threat of industrial action; and
- the Miners' Federation's opposition to dismissals regardless of the reason (Davidson 1946).

Box E.1: **The black coal industry during the Second World War**

The period during the Second World War was characterised by critical shortages of coal for Australia's war effort and near disastrous levels of industrial disputation in the black coal industry. The Government made numerous attempts to decrease the level of industrial unrest through a series of tribunals. That all were unsuccessful, typified the outcome of government intervention until the settlement of the 1949 general strike.

These attempts included the "exhortations" of the 1939 Royal Commission, for miners to discontinue their use of collective strength and management to behave "impeccably" as industrial problems continued unabated.

In February 1941, a Commonwealth Control Board was established. It was replaced in November 1941, under national security regulations, by a Conciliation Commission. Miners' demands for the establishment of a pension fund, the removal of penalties for stoppages and refusing to work a half Saturday and the authorisation of pit top meetings were all granted. However, the high level of industrial disputes continued.

Prime Minister Curtin arranged for a special conference in May 1942. From this meeting the Canberra Code emerged. Again there was agreement between unions and mine owners to cooperate and maintain discipline in the industry. Pit committees were established to prevent stoppages and increase the production of coal. However, the number of disputes continued to increase and coal production fell between 1942 and 1943.

Further legislation established a Central Coal Authority (*The National Security Act 1943*) and, a year later, provided for a Coal Commissioner to assume responsibility for the control of any mine in the interest of defence (*The Coal Production (War Time) Act No. 1 1944*).

Throughout this period of intense coal shortages it was estimated that disruptions in coal mining lowered production by 23 per cent. Alternatively, 18 per cent of the coal labour force would have been available for other tasks to aid the war efforts.

Source: Martin et al (1993).

E.3 Post-Second World War

The Joint Coal Board (JCB) was formed in 1946 as a result of the *New South Wales Coal Industry Act 1946* and the *Commonwealth Coal Industry Act 1946*. The JCB was established to address problems in the industry, especially the acute shortage of coal. Its aims included the rationalisation of the industry and its resources, safeguarding health, and the promotion of mechanisation.

This joint legislation also made provision for the establishment of the Coal Industry Tribunal (CIT). The CIT was granted both the Commonwealth powers of the Industrial Relations Commission and the State powers of the Industrial Commission of New South Wales, however, there was no right of appeal. As such, the CIT was responsible for determining the wages and employment conditions for the majority of employees in the NSW black coal industry, as well as Queensland and Tasmania by virtue of the Commonwealth Act.

From 1946 industrial disputes in the black coal industry were considered and determined by a two tiered arbitral system which was entirely separate from the mainstream Commonwealth and State industrial relations systems. The first tier involved the CIT, while the second tier was formed by Local Coal Authorities in NSW, and the Board of Reference in Queensland. The two tiers were distinguished according to the matters they dealt with, industry matters being dealt with by the CIT while local matters were the responsibility of the Authorities and Board. Decisions of both tiers were legally binding and enforceable. In practice, the powers of the CIT in determining disputes, and its definition of industrial disputes and industrial matters, were almost identical to those of the NSW and Commonwealth jurisdictions. Moreover, the CIT generally paid regard to the decisions of the Federal IRC as well as other tribunals.

The general strike of miners that occurred on 26 June, 1949 was the first serious test of the new system. It was precipitated by the CIT's rejection of the "unrealistic" demands presented by the Miners' Federation amidst a national climate of rationed electricity and gas, the closure of factories, and general unrest within the coal, steel and waterfront industries which were dominated by the Communist Party of Australia.

The Government responded to the strike through the use of the army and navy to ensure that some coal was produced. Its effect was to enforce the powers of the CIT. The strike's conclusion brought relative peace to the industry for the next twenty years.

The growth in the export market increased demand for coal in the 1960s and relative industrial peace ensued. However, the jailing of union leader Clarrie O'Shea in 1969 saw disputation return to the coal industry. Campaigns for

higher wages arose again in the 1970s and continued into the 1980s as the price of coal increased rapidly following the oil price shocks. The level of disputation increased to an all time high in 1982, when 74 per cent of lost production was attributable to disputes over wage claims.

The mining division of the Construction, Forestry, Mining and Energy Union (CFMEU) was formed in the early 1990s as a result of the amalgamation of the Miners' Federation with the Federated Mining Mechanics Association of Australia and the Federated Engine Drivers and Firemen's Association (FEDFA). The CFMEU inherited the organisational structure of the Miners' Federation and is the principal union in the black coal mining industry.

The increased national emphasis on enterprise bargaining from 1987 was mirrored in the coal industry, even though it was not formally part of the general Federal system until 1995. The CIT's September 1988 industry restructuring decision responded to deteriorating market conditions by changing "the principles of work practice applicable in the coal industry in a fundamental way" (Smith 1991, p. 25). This decision foreshadowed the Structural Efficiency Principle established by the Australian Industrial Relations Commission (AIRC) as part of its two tier wage principle and involved unions relinquishing established working conditions in order to gain wage increases. In an attempt to contain costs the decision extended shift lengths, introduced all year round production, extended overtime and introduced less prescriptive rostering arrangements. The trend to decentralised bargaining, encouraging a greater focus on productivity, flexibility, and competitiveness at the workplace, was accelerated by the insertion of provisions into the key awards enabling the parties to enter into certified agreements. According to Pragnell (1995), these agreements had many features in common with certified agreements in the Federal system.

In July 1995, the Commonwealth Government's desire to bring the coal industry into the mainstream of industrial relations resulted in the CIT and its associated Local Coal Authorities and State Boards of Reference being abolished and their functions assumed by the AIRC. Awards of the CIT continued as awards of the AIRC, and the AIRC was required to have regard to decisions of the CIT where they were relevant to coal mining matters before the AIRC. However, the *Workplace Relations and Other Legislation Amendment Act 1996* (Cth) repealed this requirement. The coal industry was assigned to a panel of members headed by a presidential member. Commissioners in Sydney and Brisbane deal with coal mining matters.

F BLACK COAL AWARDS

This appendix documents formal work arrangements found in two of the black coal industry awards:

1. *The Coal Mining Industry (Production and Engineering) Interim Consent Award, September 1990* (the P&E Award); and
2. *The Coal Mining Industry (Supervision and Administration) Interim Consent Award, 1990, New South Wales and Tasmania* (the ACSA Award).

These are presented in Tables F.1 and F.2, respectively.

Under s.158A of the former *Industrial Relations Act*, all awards were to be modernised and consolidated. Accordingly, the P&E Award was re-written and re-organised and was handed down in December 1997 as *The Coal Mining Industry (Production and Engineering) Consolidated Award 1997*. Since this process did not involve changes to any entitlements or conditions and many of the submissions for this inquiry refer to specific clauses in the former P&E Award, for this report the Commission continues to refer to the former, rather than the modernised, P&E Award.

At the time of writing, the parties to the P&E Award were involved in the first stage of the two stage award simplification process but this had not been finalised (see Section 4.3.2). Nonetheless, an arbitrated AIRC decision of 26 May 1998 (CN40113 of 1998) does provide some determinations on some those matters over which agreement had not been reached. Two matters are currently subject to appeal. The implications of the negotiations as well as the arbitrated decision are referred to in the appropriate sections throughout Chapters 4, 5 and 6.

The ACSA Award has yet to commence the award simplification process.

Table F.1: **Overview of formal work arrangements in the *Coal Mining Industry (Production and Engineering) Interim Consent Award, September 1990*[a,b]**

Type of arrangement	*Clause*	*Award provision*
Size of the workforce		
Recruitment	*22(c)*	Preference of employment to union members (party to the award) on retrenched members list. Exemptions to its use where: (1) recruiting >20 people; (2) retrenched members have absence record greater than industry average; (3) required skills not among those on list; and (4) when there is no one on the list. Prior to employer using exemption, must discuss with union. Exemptions also apply to some sites and/or employers. In any event, preference is to be given to individuals who are members of a registered union.
	22A	Preference of employment to retrenched members of CFMEU / AMWU / CEPU in Qld at Callide Coalfields (which was exempted from clause 22(c)).
	27	NSW only — employers must select in order of seniority from retrenched members list.
	32	NSW only — apprentices exempt from clauses 22 and 27.
	25	Qld only — employers must give preference of employment to employees who previously were employed in mines owned by the same company. Where clause 25 is not applicable, clause 22(b) states that in Qld preference to be given to CFMEU (UMW) division members.
	Schedule E[c]	For workplaces using open cut work model, employer can hire a new employee for levels 4–6 in production stream or 5–6 in engineering stream only if there are no existing employees at lower levels who are appropriate.
	Schedule F[c]	For workplaces using underground work model, new employee cannot be appointed to levels 5 or 6 if there are not existing employees at lower levels who are suitable.
Retrenchment	*24*	Must adhere to 'last to come, first to go' (LOFO) principle. (See also procedural arrangements.)
	29(g)	Qld only — notice of termination of employment to those on accident pay will not take effect until employee is no longer incapacitated or until the maximum period of 78 weeks from the date of the incapacitation.
	32	NSW only — apprentices exempt from clause 24.
Dismissal	*5(e)*	An employee not to be dismissed for reasons which are harsh, unjust or unreasonable.
	29(g)	NSW only — notice of dismissal to those on accident pay will not take effect until employee is no longer incapacitated or until the maximum period of 78 weeks from the date of the incapacitation.
Retirement		No provision.

Type of arrangement	*Clause*	*Award provision*
Use of casuals and contractors		No provision.
Manning levels		No provision.
Hours of work and roster arrangements		
Ordinary hours	*6(a)*	35 hours per week.
Part-time hours		No provision — except after maternity, paternity or adoption leave up to child's second birthday (see clause 33).
Overtime hours	*12(b&c)*	Employees required to work reasonable overtime hours. At least 10 consecutive hours off duty after completion of overtime.
Shift arrangements	*6(b)* *6(d)*	Maximum shift length 8 hours. Shift length greater than 8 hours only by agreement. Designated starting and finishing places to be agreed except at underground mines where starting and finishing place is the surface.
Roster arrangements	*6(e)* *6(f)*	An employee's place on roster shall not be changed, except on one week's notice or payment at overtime rates. Rostered days off allowed for (see also Annexure 1).
Paid breaks	*7*	30 minute break each shift, taken before 5 hours of work. If work exceeds 5 hours without break, overtime pay is received for work in excess of 5 hours.
	12(e)	For those on 7 hour shifts, provides for a 30 minute meal (or crib) break and meal allowance for more than 1.5 hours of overtime. For each 4 hours of overtime, further crib break and meal allowance or meal. Above clause to be used as a guide for developing agreements on crib breaks among those on more than 7 hour shifts. Such agreements to be registered.
	Annexure 1	New provisions in award on crib breaks do not affect existing agreements.
Annual leave	*15*	Monday–Friday and 6 day roster employees: 5 weeks per year. Roster employees who work holidays and 34 Sundays: 6 weeks per year. Seven day roster employees working 7 hr shifts: 30 ordinary working days. Other rosters: agreement to be reached but guide is 6 weeks for 7 day roster employees and 5 weeks for all other employees. Constraints on when annual leave can be taken — not more than 3 periods, one of which is 3 weeks. Employee to give at least 4 weeks' notice in writing.

Type of arrangement	*Clause*	*Award provision*
Long service leave	*19*	13 weeks after 8 years. Conditions also placed on time of taking leave. Portable long service leave scheme provided interruption between employment not greater than 3 months or by agreement between specified parties.
Sick leave	*16*	15 days per year. Accumulated (without limit), paid out on retirement or retrenchment. No entitlement while off work on workers' compensation matter. Employees must inform employer within 72 hours of commencing sick leave. Employees must produce authenticification upon request for any period of sick leave.
Parental leave	*33*	Covers maternity, paternity and adoption leave. Part-time employment allowed after above leave to the child's second birthday.
Other leave	*16A*	Sick leave, unpaid leave, annual leave, time off in lieu of overtime or make-up time can be used for care of immediate family member.
	18	Paid bereavement leave (2 days) and pressing domestic need leave (1 day).
	14	Public holidays to be observed on specified dates except by agreement, when they can be taken on another date.
	14(h)	7 day, 6 day or 5 day weekend employees may be asked to work on public holidays but for at least two public holidays in one year, no work is to be scheduled.
	17	Jury duty — employees to notify employer as soon as possible of dates required for jury service.
Remuneration and on-costs		
Base pay	*8*	Specifies 9 minimum rates for 107 specified occupations in Groups A to I. Group J specifies 7 rates for open cut work model and Group K specifies 6 rates for underground work model. Provision for youth (up to age 18) wages less than adults.
	10	Except for workers employed on work models, employees who perform mixed functions on a shift will be paid at the highest rate for the whole shift.
	Schedules E&F[c]	Work models establish a wage system based on skills *acquired* rather than tasks actually performed. Transitional arrangements mean that workers remain on previous rates if it is in excess of that established for the skill level under the work model.
	Schedule E[c]	Open cut work model: no restrictions on number of employees obtaining accreditation of skills up to level 3 in production stream and level 4 in engineering stream. Employer, however, can limit number of employees appointed higher levels. Unlike those aged 53 years and over, employees aged under 53 years who elect not to gain additional skills consistent with the work model will not have their pre-existing rate of pay adjusted in line with Award Rates of Pay and are required to have their skills recognised through the skills audit process.

Type of arrangement	*Clause*	*Award provision*
	Schedule F[c]	Underground work model: progression to level 4 automatic upon successful completion of required training modules. Except that requirement to progress from level 3 to 4 is completion of only one training module (and complete other modules as required). Progression to level 4 (production stream) by employer appointment after successful completion of nominated modules. Employer may limit access to levels 5 and 6 (engineering stream) and also need to complete nominated modules successfully. Unlike those who have indicated their intention to retire within 2 years of the implementation of the work model, those employees who elect not to gain additional skills under the work model will not have their pre-existing rate of pay adjusted in line with Award Rates of Pay and are required to have their skills recognised through the skills audit process.
Overtime pay	*12*	Mon–Fri workers: time and a half for first three hours, double time thereafter. Six–seven day roster workers: double time.
	12(c)	If resume work before 10 hours of rest after overtime, then paid at double time during ordinary hours.
	12(d)	Irrespective of whether notified before or after leaving the mine, an employee recalled to work overtime shall be paid for a minimum of 4 hours at the appropriate rate (except in unforeseen circumstances).
Shift pay	*13*	Shift workers receive 115 per cent of ordinary rate. Regular night shift workers receive 125 per cent of ordinary rate. Penalties to be cumulative. If a regular day shift worker works on any other shift for 3 or more consecutive days, they are to be paid at overtime rates for the first of these shifts. If work less than 3 consecutive days, other shifts to be paid at overtime rates (except where the need is caused by failure of another employee to come on duty).
	8(i)	Additional shift payments for afternoon and night shift for open cut employees.
Weekend pay	*14*	Minimum payment is 3 hours. Any work on a Saturday paid at time and a half for first 4 hours, double time thereafter. Any work on a Sunday paid at double time.
Annual leave pay	*15(l&m)*	Paid prior to commencement of leave and paid at 120 per cent of ordinary rate or what would have been earned ordinarily during projected roster (whichever is the greater).
	5(i)	Except on termination, annual leave pay cannot be paid or accepted in lieu of leave.
Bonus pay	*Annexure 1*	Removal of reference to bonus from the award. Bonuses to form part of individual mine agreements.
Sick pay	*16(g)*	Paid at the appropriate rate for the employee's classification for the ordinary hours (to a maximum of 8 hours) of the shift missed due to the employee's illness.
	16(h)	On retrenchment, termination or death, unused sick leave of 10 or more days is paid at the rate of 7 hours/unused day.

Type of arrangement	*Clause*	*Award provision*
Accident pay	*29*	Employees receiving payments under nominated workers' compensation Acts to receive accident pay from employers until the employee is no longer incapacitated or for a maximum period of 78 weeks from the date of the injury. For the first 39 weeks, accident pay is the balance of the weekly amount paid under the relevant Act and what the worker normally would have earned while on sick leave. For the subsequent 39 weeks, accident pay is the balance of the weekly amount paid under the relevant Act and the prescribed incapacitation rate at the time of the injury. Intermittent absences arising from the one injury are cumulative in the assessment of the 78 week limit. NSW only — following the expiry of retrenchment notice, employment will be terminated but employer still has liability to pay accident pay.
Superannuation contributions		No provision.
Severance and retrenchment pay	*26(a)* *26(b)*	One week's pay for each year of service. Exemption applies if within 7 days of termination, the employee could be transferred to another mine (at the same level and in the same local area) owned by the same company. In addition to severance pay, when retrenchment is due to technological change, market forces or diminution of reserves, employee receives two weeks' pay for each year of service. Minimum payment of two ordinary weeks of pay. Exemption applies if within seven days of termination, the employee could be transferred to another mine (at the same level and in the same local area) owned by the same company. Payment should not be greater than the amount the employee would have received if he had remained employed until the age of 60 years. Tribunal can grant relief from obligations of severance and retrenchment pay granted under special circumstances.
Special rates and allowances	*8(h)*	Rates and allowances include — washery, water, longwall (NSW only), shaft sinking or drift driving (NSW only), live sewer work (Qld only), dirty work, erection of scaffolding, first aid officer, first aid attendant, heat, height (Northern District, NSW), timber drawing, boom welding, licensed plumber, height (electrical / mechanical), damage to clothing and tools (electrical / mechanical – FEDFA), confined spaces (electrical / mechanical – FEDFA), shaft work (electrical / mechanical), and underground (electrical / mechanical).
Public holidays	*14(f)* *14(h)*	Employees not working on a public holiday: paid at ordinary rates. Employees working on a public holiday: ordinary hours paid at double time and overtime paid at treble time. Public holidays to be paid at ordinary rates during strike periods.
Working clothes and safety boots	*11*	Employer to provide one pair of safety boots and two sets of outer clothing per year without charge to employee.

Type of arrangement	*Clause*	*Award provision*
Travel	*28*	Employer to reimburse any reasonable transport expense incurred in travelling between home and mine when the mine is shut down. Time spent travelling outside of normal hours between ordinary location of work and temporary location is to be paid for at ordinary rates. If normal means of transport is unavailable, employer to provide transport home or pay for one hour at ordinary rates in lieu. For remote mines, employer and union to reach agreement about travelling allowance. Agreement to be registered.
Training costs	*Schedule E*[c]	All training and travel costs associated with work model to be paid for by employer.
Other on-costs	17	Jury duty — while employee is on jury duty, employer is to reimburse difference between normal pay that would have received while on jury leave and jury attendance pay.
Functions, tasks and skills		
Functions	*34*	Employee-appointed stewards are allowed time during working hours to perform normal union business.
	Schedule E[c]	For workplaces using open cut model, while no limit to employee numbers at level 3, does allow limits to employees accredited with a particular skill within this broad level — such limitations to be advised.
	Schedule F[c]	For workplaces using underground model, intention for cross-skilling between engineering disciplines and between engineering and production streams.
Job and task demarcation	*8*	Nine occupational groups. Workplaces with work models have 6 or 7 bands.
	Schedules E&F[c]	Work models designed to facilitate multi-skilling of workers. For workplaces using the work models, specifically rules out use of seniority principle in daily allocation of tasks.
Training	*32*	Employment of apprentices under relevant State training Acts except where they conflict with conditions set out in this clause.
	Schedules E&F[c]	Work model intention that employees utilise all the skills for which they have been accredited within the relevant stream. No employee is obligated to gain additional skills.
	Schedule E[c]	For workplaces using the open cut work model, longest serving employees to be offered training opportunities.
Qualifications	*Schedules E&F*[c]	Training within work model context to be part of structured and nationally accredited training programs.

Type of arrangement	*Clause*	*Award provision*
Procedural arrangements		
General	*31*	Award should not be read so as to interfere with existing customs and practices (except where specified). Custom and practice are viewed as 'in substance' agreements and hence any change entitles either unions or employers to apply to vary the award accordingly. Also, current award should not interfere with any previous award, order or determination (except where it specifically does so).
Dispute settlement	*5(f)*	Unfair dismissal arrangements.
	21	There should be no stoppages of work during a dispute over interpreting award or during the course of employment. If dispute not settled, it outlines the process for dispute settlement. Discussions along a number of steps between: (1) employee and immediate supervisor, (2) mine union representative and mine representative, (3) mine union representative and mine manager, (4) district official and nominated company official, (5) refer to relevant industrial authority. By agreement between parties, can bypass steps (2)–(4) for speedy resolution.
	30	Establishes Boards of Reference to settle disputes arising from the award and determine matters specifically assigned by the Award. Chaired by a Commissioner of AIRC, members to be 3 each of employer and union representatives. Decisions can be reviewed and altered by Presidential member of the AIRC.
Agreement making	*20*	Can trade-off or substitute provisions but need written consent of district/State secretary of union. Tribunal approval required.
Negotiating change	*23*	Right of entry to not more than two accredited union officials for each union party to the Award.
	23A	Employer's duty to notify employees and their unions of 'significant effects' (defined to include termination of employment; major changes in composition, operation or size of employer's workforce or in the skills required; elimination or diminution of job opportunities, promotion opportunities or job tenure; the alteration of hours of work; the need for retraining or transfer of employees to other work or locations or the restructuring of jobs). Employer's duty to discuss change with employees and their unions. (Discussion to include: introduction of change, likely effect of change on employees and measures to avert or mitigate adverse effects. Employer must give prompt consideration to matters raised by employees or their unions regarding change. Discussions to commence as early as practicable after definite decision made. Employer to provide in writing to employees and their union relevant information about changes. No requirement to disclose information which is inimical to employer's interests.)

Type of arrangement	*Clause*	*Award provision*
Redundancy	*26(b)* *23B*	Four weeks' notice of retrenchment to be given. Employer to hold discussions with employees and their unions. (Discussions to include reasons for proposed terminations, measures to avoid or minimise terminations and measures to mitigate any adverse effects on employees.) Employer to provide in writing to employees and unions information about proposed terminations. No requirement to disclose information which is inimical to employer's interests.
Payment of wages	*9*	To be paid each Friday, unless otherwise agreed.
Work models	*Schedules E&F*[c]	Skills audit to be conducted prior to implementing open cut work model. Changes to national work model to suit individual mine requirements to be negotiated and registered as a clause 20 agreement. Work models to be reviewed by the National Joint Working Party within 3 months of implementation.
	Schedule F[c]	Underground work model not to be implemented until site agreement (which contains certain specified features) is placed before the Tribunal.
Safety management		No provision.

a Award coverage: award applies to persons engaged in work performed in the coal mining industry in NSW, Queensland and Tasmania and is binding upon: employers listed in Schedule A of the award; the CFMEU and its members employed in classes of work or classifications set out in Schedules B, C or D of the award; the Automotive, Food, Metals, Engineering, Printing and Kindred Industries Union and its members employed in the classes of work or classifications set out in Schedule C of the award; and the Communications, Electrical, Electronic, Energy, Information, Postal, Plumbing and Allied Services Union of Australia and its members employed in the classes of work or classifications set out in Schedule C of the award.

b Occupational coverage ranges across basic semi-skilled work, semi-skilled plant and machine operator, to skilled trades levels.

c Under the 1989 Structural Efficiency Principle, employers and employees in the coal industry agreed (via two National Joint Working Parties) to introduce a new system of work organisation (that is, reducing job demarcations and broadening the classification structure) for production and engineering workers. This led to the development of the so-called open cut work model and the underground work model. However, the actual implementation of the relevant work model at each mine site is voluntary and is subject to the registration of a formal agreement through (and approval by) the CIT (and now the AIRC). Typically, clause 20 of the award has been used as a vehicle for implementing or modifying the relevant work model (Pragnell 1995). Hence, whether some of the formal work arrangements set out in the above table are observed at various mine sites will depend on the adoption (or not) of the relevant work model as set out in Schedules E and F of the award.

Source: *Coal Mining Industry (Production and Engineering) Interim Consent Award, September 1990.*

Table F2: **Overview of formal work arrangements in *The Coal Mining Industry (Supervision and Administration) Interim Consent Award, 1990, New South Wales and Tasmania*[a,b]**

Type of arrangement	*Clause*	*Award provision*
Size of the workforce		
Recruitment		No provision.
Retrenchment	*24(a)*	Preference in retaining employment given to members of the ACSA aged 60 years and under according to length of service at the mine. Second preference to those aged over 60 years according to membership of ACSA and level of seniority.
	24(b)	Possible for individual mine and ACSA to reach a decision regarding retrenchment which might be inconsistent with clause 24(a).
	18(g)	Notice of termination to employees while absent from work on sick leave not to take effect until expiration of the sick leave or the employee is fit for duty, whichever happens first.
Dismissal	*5(d)*	Employer has right to dismiss an employee without notice for refusal of duty, neglect of duty or misconduct and in such cases the wages shall be payable up to the time of dismissal only.
Retirement		No provision.
Use of casuals, and contractors	*6*	Casuals and temporary employment allowed but only upon agreement with ACSA or appropriate industrial authority.
Manning levels		No provision.
Hours of work and roster arrangements		
Ordinary hours	*7(a)*	Employees in Groups A to F: average of 35 hours per week. Employees in Groups G to N: average of 37.5 hours per week. Employees in Groups O to P: average of 40 hours per week. Ordinary hours averaged over 4 weekly period or in the case of 6 and 7 day roster employees, over the length of the roster cycle (or other agreed period). The ordinary working hours of any shift to be worked to be agreed (where no agreement, industrial authority to determine).

Type of arrangement	*Clause*	*Award provision*
Part-time hours		No provision.
Overtime hours	*14(b)*	Agreement may be made to have time off in lieu of overtime at a mutually convenient time.
	14(c)	All employees required to work reasonable overtime.
	14(d)	All employees (except Groups G to P) to have at least 10 hours off duty between work on successive days. If this does not occur, then time off is to be taken without the loss of pay of ordinary hours on the following day. If, however, instructed to resume duty without 10 consecutive hours off then work is to be paid at double time during ordinary hours until released from duty. Following release, employee is entitled to 10 consecutive hours without the loss of ordinary pay.
	14(e)	Overtime worked on call back not to be regarded as overtime for purposes of rest period in clause 14(d) where actual time on the recall is less than 4 hours.
Shift arrangements	*7(b)*	Employer to determine shift length to maximum of 8 ordinary hours. Shifts of more than 8 ordinary hours can be implemented only by agreement.
	7(c)	Number and spread of ordinary shifts can be varied by employer or by order of appropriate industrial authority.
Roster arrangements	*7(d)*	Employee's place on a roster shall not be changed, except with one week's notice of such change or payment at overtime rates.
	7(e)	Rostered days off allowed. Employer to give 4 weeks notice of rostered day off (except by agreement). With agreement of employer, individual employees able to substitute the rostered day off for another day.
Paid breaks	*8*	Crib break of 30 minutes per shift to be counted as working time. Employees in Groups A to F not to work for more than 5 hours without a crib break. If work for more than 5 hours without crib break, employee to be paid for work beyond 5 hours at overtime rates until crib break is taken.
	14(f)	Overtime after 7 ordinary hour shifts — for all employees (except Groups G to P), where overtime work is more than 1.5 hours, unless agreed otherwise, before starting overtime must have a paid meal break of 30 minutes. Unless notified the previous day of overtime, employer to supply a meal or meal allowance (except for those employees who can reasonably go home for a meal). After each 4 hours of overtime worked following a crib break, employees to have a further crib break and either be supplied with a meal or meal allowance.
	14(g)	Overtime after shifts other than 7 ordinary hours — for all employees (except Groups G to P) appropriate arrangements to be agreed to ensure that an employee working overtime is allowed adequate breaks for crib and 14(f) to be used as a guide. Agreement to be registered with the AIRC.

Type of arrangement	*Clause*	*Award provision*
	19	Jury service — employer to reimburse difference between amount paid for attendance at jury and the amount of wage that would have been received in respect of ordinary pay as if the person had not been on jury service. Employee to notify of jury service leave as soon as possible and give proof of attendance.
Annual leave	*17(a)*	Monday to Friday and 6 day roster employees — 5 weeks annual leave, credited on the anniversary of commencement.
	17(b)	Roster employees who work holidays and 34 Sundays per year — 6 weeks annual leave, credited on the anniversary of commencement.
	17(c)	7 day roster employees on 7 ordinary hours shifts — 30 ordinary working days, credited on the anniversary of commencement.
	17(d)	Other roster employees — period of annual leave to be determined by agreement or relevant industrial authority. A guide to be 6 weeks per annum for 7 day roster employees and 5 weeks per annum. Agreement to be registered with AIRC.
	17(e)	Pro-rata leave to be given for employees who worked 7 day, 6 day or 5 day weekend roster during the relevant 12 month period.
	17(f)	Annual leave to be given and taken in not more 3 periods (one of which to be of 3 weeks duration) except those employees who take full accumulation in one period. (Exception possible by agreement.) Employee to give at least 4 weeks notice in writing and allowed to take leave unless, in the opinion of management, the operations will be adversely affected by the granting of leave at that time.
	17(g)	Employees allowed to take leave before right has accrued. If the employee fails to qualify for the leave then employer can recover the pre-payment by deduction from monies payable to the employee.
	17(h)	Public holidays falling during leave period to be added to leave.
	17(m)	Annual leave to accrue at the rate of 3.3654 hours for each completed week of service except where 6 weeks or 30 days annual leave is granted. In the latter case, annual leave to accrue at the rate of 4.0385 hours for each completed week of service.
Long service leave		No provision. See *Long Service Leave (Staff) Award*.
Sick leave	*18(a)*	Upon commencement and every subsequent 12 months, each employee credited with 15 days sick leave.
	18(b)	Unlimited accumulation.
	18(c)	Sick leave taken to be deducted from accumulated sick leave.
	18(d)	No entitlement to sick leave if employee is entitled to workers' compensation.

Type of arrangement	*Clause*	*Award provision*
	18(e)	Employee to notify of inability to attend as soon as possible but no later than end of first shift missed. Employee to prove that absence was on account of illness or injury.
Parental leave	*21*	Maternity leave provisions.
Other leave	*16(d)*	At least 10 public holidays specified per annum.
	16(e)	Possible to reach agreement between management and majority of employees to observe any holiday on a day other that prescribed in Clause 16(d).
	20	Maximum of 2 days paid bereavement leave for death of specified family members (where leave is extended to cover balance of shift if employee notified of death when at work). One day of paid pressing domestic leave.
Remuneration and on-costs		
Base pay	*10*	Minimum rates specified for employees from Group A to Group P. Junior rates specified as percentage of Group A rate. Graduate rates specified as percentage of Group J and K rates. Cannot use the award as a basis for paying employees less than rate currently received (if receiving more than minimum set out in award).
	12	Where employee's work involves mixed functions, minimum wage to be paid is that for the highest relevant rate and for the entire shift concerned.
	5(b)	Employee to lose pay for actual time of non-attendance or non-performance.
Overtime pay	*14(a)*	Monday–Friday employees in Groups A to F: overtime at time and a half for first 3 hours and double time thereafter. All 6 or 7 Day Roster employees and Monday to Friday employees in Groups G to P: all overtime at rate of double time. To calculate overtime under this clause, appropriate weekly rate to be divided by 35. Agreement may be reached to average overtime payments over the length of a defined period. In this case, overtime to be calculated on a pro rata basis.
	14(e)	Call Back — an employee recalled to work overtime (whether notified before or after leaving the mine) after leaving the mine shall be paid for a minimum of 4 hours at appropriate rate for each time recalled. Employee not required to work for full 4 hours if job is completed in a shorter period. (Sub-clause not to apply in cases where it is customary for employee to return to perform a specific job outside their ordinary working hours.)
Shift pay	*10(f)*	Roster employees in Groups G to N working a 6 or 7 day roster, pay to increase by 3.2 per cent and for Groups O and P by 3.4 per cent.
	15(a)	For all time worked on afternoon or night shift, 15 per cent shift premium.

Type of arrangement	*Clause*	*Award provision*
	15(b)	Permanent night shift (that is, night shift only or on night shift for period longer than 4 consecutive weeks or works on a roster which does not give at least one third of the employee's working time off night shift in each roster cycle), 25 per cent shift premium.
	15(c)	Open cut employees additional shift premium — $1.80 per afternoon shift and $3.61 per night shift.
	15(d)	Change of shift pay — all normal day shift employees (except Groups G to P) who are required to work another shift for at least 3 consecutive working days, to be paid at overtime rates for the first shift so worked and thereafter be paid according to appropriate provisions. If required to work for less than 3 consecutive work days, overtime rates to be paid for all afternoon or night work (unless the requirement is caused by the failure of any other employee to come on duty at the proper time).
	15(e)	For 6 and 7 day roster employees — percentages in clauses 15(a) to (d) to be cumulative on any penalty rate prescribed and calculated on the ordinary rate.
Weekend pay	*16(a)*	Unless continuous with work commenced on the previous day, an employee (other than those on ordinary hours of work) called to work on a weekend or public holiday to be paid for at least 3 hours at the appropriate rate (to be calculated by dividing the weekly rate by 35).
	16(b)	For 7 day, 6 day or 5 day weekend roster employees — Saturday work to be paid at time and a half for first 4 hours and double time thereafter.
	16(c)	Sunday work paid at double time.
Annual leave pay	*17(m)*	7 day roster employees — payment to be according to projected roster (including weekend and holiday pay up to double time, shift allowances and any rostered overtime) or at 120 per cent of the employee's ordinary rate (whichever is the greater) 6 day roster employees — payment to be according to project roster (including weekend and holiday pay up to double time, and any rostered overtime); or 120 per cent of the employee's ordinary rate (which ever is the greater). Monday–Friday roster employees — payment to be according to projected roster (including any rostered overtime) or at 120 per cent of employee's ordinary rate whichever is the greater.
	17(i)	Payment in lieu of annual leave not allowed.
	17(k)	Annual leave to be paid on pro-rata basis where employer shuts down the mine or section(s) of a mine. Four weeks notice of shut-down to be given.
	17(l)	Annual leave to be paid in advance on commencement of leave.
Bonus pay		No provision.

Type of arrangement	*Clause*	*Award provision*
Workers' compensation		See Accident Pay provisions (clause 28).
Sick pay	*18(f)*	Payment at appropriate rate for ordinary hours (to a maximum of 8 hours) of the shift missed.
Accident pay	*28*	Employees in receipt of weekly workers' compensation payments (according to the *Workers' Compensation Act 1986, NSW*) are entitled to receive accident pay from employer subject to sub-clauses (a) to (h).
	28(a)	Received until either incapacity ceases or up to 78 weeks from date of injury (whichever occurs first).
	28(b)	For the initial 39 week period, accident pay is the difference between workers' compensation pay and the amount that would have been received if the employee had been on paid sick leave. For the subsequent 39 week period, accident pay is the difference between workers' compensation pay and the rate prescribed for the classification of the incapacitated employee at the day of the injury.
	29(c)	Payment for part weeks to be on a pro-rata basis.
	29(d)	No entitlement to accident pay while on annual leave, long service leave or for paid public holidays.
	29(e)	Where an employee receives a lump sum workers' compensation payment, the employer's liability to pay accident pay ceases on the date of the lump sum payment.
	29(f)	Where an employee recovers damages from the employer or a third party independent of the Act, then the employee must repay the total accident pay received and is not entitled to future accident pay.
	29(g)	Where employment is terminated while on accident pay, the termination shall not take effect until the incapacity ceases or the expiration of the 78 week period above (whichever occurs first). Where employee is retrenched, the employer is still liable to continue accident pay for specified period.
	29(h)	The 78 week period starts from the first day of incapacity for work (which may be subsequent to the date of injury). Intermittent absences arising from the one injury are to be cumulative in the assessment of the 78 week limitation.
Superannuation contributions		No provision.
Severance and retrenchment pay	*26(a)*	Severance pay: 1 week's pay for each completed year of employment. Employer not liable if employee is re-employed in similar or higher permanent position at another mine operated by the same employer within 7 days of date of termination.
	26(b)	Retrenchment pay: where termination is because of technological change, market forces or diminution of reserves, in addition to severance pay, employee to receive 2 ordinary weeks' pay for each completed year of employment with a minimum payment of 2 ordinary weeks' pay. Employer not liable if employee is re-employed in similar or higher

Type of arrangement	*Clause*	*Award provision*
		permanent position at another mine operated by the same employer in the same District within 7 days of date of termination. Maximum entitlement set at amount employee would have received until the age of 60 years.
	26(c)	Under special circumstances employer may be granted relief from obligation to pay retrenchment pay.
	26(b)	Casuals and temporaries not eligible for severance or retrenchment pay.
	17(j)	Annual leave to be paid on pro-rata basis on termination of employee (except by dismissal for wilful misconduct). Annual leave loading not payable pro-rata. Annual leave paid on termination.
	17(h)	Sick leave to be paid out on termination (either through retrenchment, or through mine workers' pension legislation because of age, or through ill health, death) to employees who have accrued ten or more days of unused sick leave paid on the following basis: Group A to F employees — 7 hours of ordinary pay for each day accrued and not taken; Group G to N employees — 7.5 hours of ordinary pay for each day accrued and not taken; and Group O to P employees — 8 hours of ordinary pay for each day accrued and not taken.
Special rates and allowances	*10(g)*	Special rates include: (1) Washery Allowance — in lieu of all other disability allowances except water money; (2) Water Money — for Group A to F employees; (3) Longwall Allowance; (4) First Aid Officer; and (5) First Aid Attendant.
Public holidays	*16(f)*	For employees not working on public holiday — pay is to be at appropriate rate. For those working on public holidays, rate for work during ordinary hours is at double time and rate for overtime on a public holiday is at treble time.
	16(g&h)	Provisions relating to rostered days off and public holidays.
Working clothes and safety boots	*13*	Each employee entitled to one pair of safety boots per year at no charge by employer. Each employee entitled to 2 sets of industrial outer clothing at no charge by employer.
Travel	*27(a)*	Expenses incurred in excess of the normal expenses incurred in travelling between home and the mine will be refunded to employees who are asked (and who do) attend the mine when the mine is on annual leave shutdown.
	27(b)	Under circumstances where the employee is required to work away from usual location, travelling time is to be paid at ordinary rates where travel time is in excess of normal travel time from home to work.
	27(c)	Where employees are asked to work overtime (either pre- or post-shift) and their normal means of transport is unavailable, employer is to provide transport home or pay one hour at ordinary rates in lieu.
	27(d)	When a mine is considered remote, agreement can be reached as to payment of travelling allowance. Such agreement to be registered and become part of the Award.

Type of arrangement	*Clause*	*Award provision*
Training costs		No provision.
Other on-costs	*22*	Housing — where employer requires employee to occupy a mine residence, it is to be provided rent free.
	25	Union representative allowed necessary time during work hours to interview the employer.
Functions, tasks and skills		
Functions	*5(b)*	Employees to perform work reasonably required by the employer, including work which is incidental or peripheral to the employees' main task.
Job and task demarcation	*9*	No new classifications can be created by employer unless by agreement but because of differing mine circumstances not all classifications need to be used at each mine.
	10	85 occupations grouped into 16 broad Groups (A to P) — range from Group A 'Tracer, Surveyors Assistant, Clerk, Stores Clerk, Laboratory Assistant, Technical Assistant, Trainee, and Coal and/or Dust Sampler 1st year of Adult service in the coal mining industry' to Group P 'Undermanager (In Charge)'.
Training		No provision.
Qualifications		No direct provisions except those provided for in clause 10.
Procedural arrangements		
General	*5(a)*	Employment is on a weekly basis.
	11	Wages to be paid each Friday, unless otherwise agreed. When employer elects and employee has reasonable direct access to financial institution(s), wages to be paid direct into specified account of employee. Wages to be paid by cheque where agreed. In absence of agreement to contrary, employer not to keep more than one week's pay in hand.
	29	Provisions to establish Board of Reference in Tasmania under the AIRC.
	30	Except where stated, the Award is not to be read as interfering with existing customs and practices. Customs and practices are viewed as in substance agreements between the parties.
Dispute settlement		No direct provision except indirectly via clause 29, which establishes Boards of Reference.

Type of arrangement	*Clause*	*Award provision*
Agreement making	*31*	Any agreement which proposes to substitute and/or trade-off and/or set off any matters, then any agreement shall not be implemented without the written acceptance of the Branch Secretary of the ACSA. The agreement shall: (1) have a specific term; (2) include the ACSA in any dispute resolution process; and (3) be referred to the AIRC for approval prior to implementation. If the written acceptance of the Branch Secretary is withheld unreasonably, the employer may apply to the Tribunal for approval.
Negotiating change		No provision.
Redundancy	*5(c)*	Employment can be terminated by a week's notice on either side, given at any time during the week or by the payment or forfeiture of a week's wages as the case may be.
	11(e)	Upon termination of employment, wages due paid on last day or forwarded within 72 hours.
	26(b)	Where retrenchment is due to technological change, market forces or diminution of reserves, employer to give employee one month's notice of retrenchment.
Payment of wages		No provision.
Safety management		No provision.

a Award coverage: all coal mining industry employers in the NSW and Tasmania named in Schedule 'A' of the Award in respect of members of the Australian Collieries' Staff Association employed by them, the ACSA and its members.

b Occupations covered by the Award: all professional; semi-professional; supervisory; semi-supervisory (including Deputies); administrative and clerical employees in the coal and oil shale industry.

Source: *The Coal Mining Industry (Supervision and Administration) Interim Consent Award,* 1990, (New South Wales and Tasmania).

G BLACK COAL AGREEMENTS

This appendix sets out the formal arrangements found in eight recent black coal industry agreements, certified under the Federal jurisdiction. All agreements relate to the production and engineering workforce within each mine. They include the following:

- Stratford — brownfield open cut mine (truck and shovel). Owned by Stratford Coal Pty Ltd and operated by Henry Walker Contracting Pty Ltd. Major shareholder: CIM Resources Pty Ltd. Located 95 km north of Newcastle, NSW.
- Burton — brownfield open cut mine (truck and shovel). Owned by Burton Coal Joint Venture. Operated by Thiess Contractors Pty Ltd. Major shareholder: Portman Mining Ltd (95 per cent). Located 40 km northeast of Moranbah, Queensland.
- Ensham — greenfield open cut mine (dragline). Owned by Ensham Resources Pty Ltd. Major shareholder: Idemitsu Kosan (85 per cent). Located 40 km northeast of Emerald, Queensland.
- Muswellbrook — brownfield open cut mine (truck and shovel). Owned by Muswellbrook Coal Company Pty Ltd. Major shareholder: Idemitsu Kosan Co Ltd (100 per cent). Located 5 km northeast of Muswellbrook, NSW.
- Southern Colliery (German Creek) — brownfield underground mine (longwall). Owned by Capricorn Coal Development Joint Venture. Major shareholder: Shell Company of Australia Ltd (47 per cent). Located 70 km northeast of Emerald, Queensland.
- South Bulli — brownfield underground mine (longwall). Owned by Bellambi Collieries Pty Ltd. Located 15 km north of Wollongong, NSW.
- Crinum — greenfield underground mine (longwall). Owned by Broken Hill Proprietary Co Ltd (59 per cent). Located 60 km northeast of Emerald, Queensland.
- Oaky Creek — brownfield open cut mine (dragline). Owned by Oaky Creek Coal Joint Venture. Major shareholder: MIM Holdings Ltd (75 per cent). Located 60 km north of Blackwater, Queensland.

The eight agreements are documented in Tables G.1 to G.3.

Table G.1: **Overview of formal work arrangements in recent black coal mining agreements: Stratford, Burton and Ensham**

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
Size of the work force			
Recruitment	36 — nominally one cleanskin for one current or retrenched miner. Selection based on skills, work history and other standardised prerequisites such as aptitude tests, medical fitness tests and drug and alcohol tests. Positions for retrenched and current mineworkers shall be discussed between the parties prior to employment. Where no suitable current or retrenched mine workers apply and upon agreement with the union, cleanskins shall be considered. 37 — increase in hands — where company decides on an increase in hands former retrenched employees who apply shall be re-engaged on a length of service at the mine basis and according to their respective work stream. Provision for the company and union to reach alternative agreement.	12 — recruitment — Award provisions apply subject to the following: the parties will cooperate fully with a view to the application of equal employment opportunity standards to all recruitment and will not apply artificial barriers that restrict employees being drawn from across the total community. 1 — union coverage — preference of employment in the engagement of labour shall be given to applicants who are members of the CFMEU or who undertake to join the CFMEU within 14 days of accepting employment.	20 — equal employment opportunity — personal merit and criteria related to the effective performance of the job shall determine employment, selection for specific jobs, and career progression.
Retrenchment	26 — parties will endeavour to agree upon method for reduction to occur addressing the following: whether the reduction can be achieved entirely or partly by volunteers; criteria in	No provision — see Award.	5 — security of employment — no forced retrenchments during the life of the agreement except in the event of an unforseen major circumstance beyond the control of Ensham and its employees

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
	selecting employees will include skills, attendance, competence, performance, physical fitness for the role etc; and upon failure to achieve the desired number of volunteers, remaining redundancies will be achieved by agreement. Redundancies determined according to length of service in respective streams upon failure to reach agreement.		preventing Ensham from carrying out the business of coal mining. 20 — equal employment opportunity — personal merit and criteria related to the effective performance of the job shall determine termination of employment.
Dismissal	5.6 — grounds for unfair dismissals same as Award but in addition includes the ground of physical or mental disability.	No provision — see Award.	No provision in Agreement.
Use of casuals, contract employment and contractors	Appendix B — contractors — parties recognise need to engage contractors at various times both on and off site, and that this will not threaten the job security of the workforce. Where contractors are required to perform work normally performed on site the following will apply: at least one week's notice will be given to the appropriate union representative prior to work commencing, and agreement reached on the nature and scope of the work; full use of available site labour should be made; the disputes procedure will be followed where the parties fail to agree on the use of contractors. The company will determine and advise the appropriate union representative of the use of contractors for work not normally carried out by site	13 — contractor/sub-contractors. Provision for contractors and sub-contractors to be used for peak loads, specialist work or economic reasons. On and off site contractors may be used to supplement the facilities on the mine where it is economical and practical to operate on a component charge-out basis, such components being serviced by contractors, as well as where required for major works. The employer may also contract the functions of sampling, office cleaning and village services. Relevant site delegate to be given as much notice as possible of such requirements.	9.1.2 — casual employees — may be utilised to a maximum of 7 shifts in any 14 day period. Casuals shall receive an additional amount of 7.8 per cent of their appropriate salary. Casual employees are specifically excluded from the benefits in clauses 8 (other than 8.1 to 8.3), 12, 13, 15, 16, 17, 19 and 22. 9.1.3 — contractors — may be utilised in a stand alone situation and where the economics for the short-term duration do not warrant 7 days x 12 hours operation or the contract labour involves utilising skills or equipment that is not incidental in the site Schedule of Skills. Ensham undertakes to ensure that all contractors meet Award/industrial agreement obligations relevant to their operations.

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
	personnel. Equipment failure requiring contractors to perform repair work shall be notified to the appropriate union representative as soon as possible. Contractors will work in accordance with this Agreement. The Company will advise the union at least one week prior to the commencement of a major shut down. 32 — casual employment — at discretion of company and upon notification to the appropriate union representative casuals may be used for annual leave absences other than single day absences. Other requirements for casual labour shall be by agreement between the parties and shall be determined on economic criteria and flexibility considerations. Casual labour will be supplied by United Mine Support Services.		
Manning levels	Appendix E — 'hot seat' change-over.	No provision — see Award.	No provision.
Hours of work and roster arrangements			
Contract of employment	Same as Award.	No provision — see Award.	6 — same as Award except employment by the fortnight. In addition Ensham only able to deduct payment for period where employees stood down where coal mining unable to be carried out for 28 days, not 4 days as in the Award.

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
Ordinary hours	8 — average of 35 hours per week — same as Award. Shifts will be of 8.5 hours duration providing 42.5 hours of rostered work each week.	2 — average of 35 hours per week — same as Award.	No provision.
Part-time hours	No provision — see Award.	No provision — see Award.	No provision.
Overtime hours	Shift arrangements provide an average of 7.5 hours of overtime per week. Overtime allowance will be 17 hours per week averaged over a 4 week period. Christmas, Easter and one other nominated period may be subject to an additional, reasonable overtime allowance. Overtime attributed to train loading may not be restricted by the overtime allowance. Overtime restrictions apply to contractors as per Appendix D; however, the overtime allowance for Contractors is 17 hours per week averaged over a 2 week period.	2 — hours of work — employees may be required to work a reasonable amount of rostered overtime or as the need arises as per Award. Appendix A — Monday–Friday roster averages 5 hours of rostered overtime per week. 7 day roster averages 7 hours of rostered overtime per week.	7.4.5 — provides a minimum 10 hour break where an employee is recalled to work or works beyond a 12 hour shift.
Shift arrangements	8 — a 2 shift rotating weekly roster (day and afternoon shift) will generally be worked for mine operations. The CHPP plant operates with 3 crews rotating on the basis of 2 day shifts and 1 afternoon shift. Night shift and Permanent day workers will work on a fixed shift basis. Normal starting and finishing times specified. ‘Hot seat’ change-over to occur in accordance with Appendix E. Introduction of alternative shift rosters by agreement.	2 — hours of work and rosters — travel to and from designated work areas shall be in addition to normal shift identified in Appendix A.	12 hour shift arrangement (see roster arrangements).

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
Roster arrangements	8.8 — starting and finishin g places for shifts and CHHP employees shall be at the muster point adjacent to the bath house. Appendix E — 'hot seat' change-over — a 'hot seat' change-over between operating crews will take place on the job, allowing time for exchanging information and plant inspections. For all other employees (ancillary plant, excavators, other employees involved on continuous operations or other employees as the operation requires) the off-coming shift will continue working until relieved.	2 — hours of work and rosters — on commencement of operations employees will work the Monday–Friday pattern. At discretion of employer roster may be moved to 7 day pattern. Appendix A — 12 hour shifts provided for both Monday–Friday and 7 day rosters.	7 — hours of work — Ensham site-based roster comprises 6 crews. 4 crews work on a rotating roster of day and night shifts while 2 crews are permanently on day shift. Each crew works 7 days on followed by 7 days off. Week commences on Tuesday.
Paid breaks	11 — crib breaks same as Award except that crib breaks are scheduled to commence between 3 and 5 hours from the start of the shift. 9.5 — paid meal break of 30 minutes and a meal or $7.30 to be provided before starting 3 hours' or more overtime which is outside of their normal shifts. 9.6 — each consecutive 5 hours' of overtime shall attract a further paid crib break and a meal or $7.30.	7 — two paid 30 minute crib breaks per 12 hour shift, to be taken in a manner not interfering with the continuity of work. An employee shall not be required to work for more than five hours without a meal/rest break.	7.3 — meal breaks and refreshment facilities. Two 30 minute paid meal breaks and one 10 minute 'smoko' in each 12 hour shift to be taken to suit individual and operational needs. The first meal break shall normally be taken between 3.5 and not more than 5 hours after shift starting time and the second meal break no more than 5 hours after completion of the first meal break. Adequate refreshment facilities suitable for heating and cooling of pre-cooked foodstuffs shall be provided.
Annual leave	22 — generally same as Award. 25 days' annual leave each year. May be taken in single days to a maximum of 5 per annum. Upon termination paid at the rate of 8.5 ordinary hours. Employees with more than	5 — annual leave taken in the form of 17 shifts for Monday to Friday roster or 21 shifts for 7 day roster employees. Except where otherwise agreed to be taken in block of consecutive shifts	12 — annual leave of 210 hours for each completed year of service, accruing at the rate of 16.1538 hours for each completed Ensham site-based roster cycle.

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
	25 days' annual leave may be directed by the company to take annual leave.	within one year of falling due. Minimum of one block may be taken at any time.	
Long service leave	23 — same as Award except payment upon termination does not exclude dismissal for serious or wilful misconduct. In addition, no provision for union officials — credit for prior service.	No provision — see Award.	17 — same as Award but does not include provision for union officials — credit for prior service.
Sick leave	17 — entitlement same as Award. Employees to notify within 24 hours of commencement of sick leave and estimated likely duration. A doctor's certificate is required for any sick leave of 2 consecutive days or more or any subsequent days where an employee has already taken 3 single days in a year. Appendix C — establishes a 3 step absenteeism procedure. In assessing an employee's absenteeism record, consideration shall be given to: the total number of days absent; patterns of absenteeism; recent and long-term absence; and any other factors affecting the employee's ability to attend for work.	6 — paid in advance to the individual or a nominated superannuation fund every 6 months equivalent to half of 15 days of 7 hours ordinary pay. Employees to notify, where practicable, of absence and expected duration prior to the first shift affected. Advanced payment to be deducted from monies owing should an employee terminate his employment during any six monthly term. Employer to facilitate employee participation in income protection scheme if they desire at the expense of the employee. Employer's right to seek explanations for absence, implement an absenteeism review procedure, and take disciplinary action concerning undue absenteeism is not affected. Employee has access to an appropriate industrial authority in a dispute over undue absenteeism.	13 — personal leave — entitlement of 84 hours (= 7 x 12 hour days) personal leave credit for the first full year of employment and 60 hours (= 5 x 12 hour days) credit for each ensuing year. Any credits in excess of 12 days may be transferred into Superannuation fund on the anniversary of employment. Refunded on retrenchment. 14 — sick and accident/salary continuance insurance — an employee unable to work for a period in excess of 7 rostered shifts due to personal illness shall be provided with salary continuance insurance.

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
Parental leave	24 — entitlements as prescribed in the *Workplace Relations Act 1996* (as amended).	No provision — see Award.	18 — provisions of Schedule 14 of the *Industrial Relations Act 1988* apply to and are deemed to form part of the agreement.
Other leave	18 — jury leave — same as Award. 19 — compassionate leave — same as Award but includes grandparent and grandchild. Pressing domestic leave — same as Award but in addition employee must supply satisfactory evidence. 20 — special family leave — employee with responsibilities in relation to members of their immediate family or members of their household requiring care and support may use accumulated sick leave for that purpose. Employee required to establish illness with medical certificate. Employee must inform company of intention to take special family leave, the person requiring care and the reasons for taking leave and the estimated absence. With the consent of the company an employee may take unpaid leave to care for a family member who is ill once all other sources of accumulated leave are exhausted.	No provision — see Award.	19 — jury service — same as Award except that employee continues to be paid instead of being reimbursed. 16 — bereavement leave — same as Award except provision for additional leave to be approved for bereavement reasons by Ensham in which case the employee will not suffer any loss in pay for approved leave under the circumstances.
Remuneration and on-costs			
Base pay	10.2 — aggregate weekly wage incorporates most allowances: Level 1 — Induction — $711.55 Level 2 — Experienced — $759.70	3 — earnings. Appendix A — total annual salaries include all disabilities except advanced sick leave. Mineworker (7 day roster)	8.1.2 — annual salary packages Continuous day/night roster: Level 1 — $78 584 Level 2 — $73 056

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
	Level 3 — Advanced — $786.45 Wages increase by 2.91 per cent after 12 months. Wages include allowances for 'hot seat' change, tolerance time and flexibility of crib times. 31 — parties to explore salary sacrificing arrangements with intention of benefiting both parties to the agreement.	Production — $75 250 Engineering — $75 470 Washery — $75 670 Mineworker (Monday to Friday) Production — $58 750 Engineering — $58 970 Washery — $59 170 Co-ordinator (7 day roster) Production — $77 750 Engineering — $77 970 Washery — $78 170 Co-ordinator (Monday to Friday) Production — $60 500 Engineering — $60 720 Washery — $60 920	Level 3 — $69 756 Level 4 — $63 130 Level 4A — $58 622 Continuous day roster: Level 1 — $73 430 Level 2 — $68 278 Level 3 — $65 164 Level 4 — $58 994 Level 4A — $54 862 8.1.3 — rates increase by 3 per cent on July 1 1996 and a further 4 per cent on July 1 1997.
Overtime pay	9.1 — all overtime worked is paid at double time.	Appendix A — Rostered overtime is included in annualised salary at Monday–Friday roster and 7 hours for the 7 day week roster. One hour of non-rostered overtime per rostered period is included in annualised salary. This amount to be reviewed and adjusted on a six monthly basis based on site work records. No back pay. Appendix A — Travel to and from designated work areas provided for at overtime rates in salary calculations.	7.4 — hours beyond roster — no employee will be required to work in excess of 12 hour rostered shift or be recalled after completion of shift other than in an emergency or extreme circumstances and only then by agreement. An employee required to work in such circumstances shall not be required to work in excess of 4 hours excluding a meal break. An employee required to work for more than 1.5 hours beyond the 12 hour rostered shift will be supplied with a meal and a paid 30 minute break. 7.4.4 — payment for hours beyond roster Continuous Day/Night roster: from $50 to $67 depending on level.

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
			Continuous Day roster: from $46.80 to $62.60 depending on level.
Shift pay	8.7 — afternoon shift attracts a loading of 15 per cent while night shift attracts a loading of 25 per cent.	Appendix A — Dayworkers receive the same amount as provided above in annualised salary less $3 000.	8.1.2 — Annualised salary approximately 7 per cent higher for continuous day/night roster than for day roster.
Weekend pay	No provision — see Award.	3 — included in annualised salary.	No provision.
Annual leave pay	No provision — see Award.	5 — paid annualised salary — includes average rostered and unrostered overtime, allowances etc.	No provision.
Bonus pay	Henry Walker CFMEU — Stratford Coal Mine Bonus Agreement 1997. A weekly bonus of $335 to be paid upon ratification of the agreement. Bonus applies to individuals on days worked and days of approved leave. Twelve months after the expiration of the Industrial Agreement and upon achieving Coal and Waste Production Targets for the previous 12 months a further $15 per week Bonus will become available.	Salary levels adjusted on 1 February 1997 according to total volume of material moved per man shift worked: from 2.5 to 7.5 per cent for 945 m^3 to 1080 m^3, respectively.	8.3.2 & .3 — production reward scheme — $120 per employee per week. Performance incentive payment — employees at level 2 who perform all the skills consistent with that level as required and who attend for work no less than 92 per cent of the time between 1 January 1995 and 1 January 1996 shall receive a performance incentive payment of $25 per week. This will be increased to $50 per week from 1 July 1996 for the review period from 1 July 1995 to 1 July 1996. Either 50 per cent or 100 per cent of the payments may be made into an approved superannuation fund.
Workers' compensation	27 — workers' compensation — injured employee entitled to payment in accordance with *Workers' Compensation Act 1987* (as amended) as it relates to the coal mining industry.	No provision — see Award.	No provision.

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
Sick pay	17.4 & .7 — paid for rostered shift (8.5 hours pay). Payment of sick leave on termination — an employee who has accrued ten or more days' sick leave shall be paid 8.5 hours ordinary pay for each day upon retrenchment, termination arising from the Mineworkers' Pension Legislation or ill health, or death.	Appendix A — advanced annual sick leave payments: Mineworker — $1758.60; and Co-ordinator — $1836.30	13.3 — personal leave credits refunded to employees on retrenchment. 14 — Ensham covers all employees with 24 hour Sickness and Accident/Salary Continuance Insurance and Total Permanent/Disablement/Death cover insurance.
Accident pay	28 — same as Award.	No provision — see Award.	15 — same as Award except that for the second period of 39 weeks a weekly payment of $850 is made.
Superannuation contributions	29 — provisions of Coal Super Retirement Income Fund, as varied from time to time, apply to employees under the Agreement.	No provision — see Award.	No provision.
Severance and retrenchment pay	5.5 — contract of employment — required period of notice same as Award.	No provision — see Award.	22.1 & .2 — one twenty-sixth of the employee's annual payment for each completed year of service together with the production reward payment and the accommodation assistance subsidy. Special circumstances — same as Award.
Special rates and allowances	10.1 aggregate wage absorbs all allowances with the exception of: tool allowance — $20 per week; first aid allowance — $2 per day; and first aid officer — $3.45 per day.	3 — earnings — annualised salary covers all allowances.	No provision.
Public holidays	21 — entitlements same as Award. Paid for 8.5 hours. No provision for rostered day off falling on a public holiday.	No provision — see Award.	11 — 10 days listed plus any day gazetted in Queensland. No work performed on Christmas day or Boxing Day. Public

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
			holidays falling in an employee's on-shift work roster are worked.
Working clothes and safety boots	14 — in addition to Award entitlements employer to supply one set of protective hat and glasses, one winter jacket, one set of wet weather gear and any other miscellaneous safety gear. Tradesmen to receive three additional sets of protective outer clothing.	No provision — see Award.	8.7 — entitlements generally same as Award except for an additional set of industrial outer clothing. Industrial outer clothing and safety boots replaced annually, and at other times only in extenuating circumstances. Requirement that safety and protective equipment are worn and continued failure to do so could jeopardise an employee's continued employment.
Travel	25 — same as Award.	9 — Thiess to supply travel to and from the village and the job site. Employees to arrange their own travel to and from their place of residence and the mine village. Discussion over provision of transport from major population centres to occur after employee's residential patterns are confirmed.	No provision.
Training costs	No provision — see Award.	No provision — see Award.	No provision.
Other on-costs	16.7 — disputes procedure — where an industrial issue is referred to an industrial authority representatives and witnesses shall not suffer any loss of pay and the company shall pay reasonable travel and other expenses. Any more than two representatives / witnesses shall be by agreement.	8 — accommodation — individually allocated ensuite units and three meals per day to be supplied to employees for their rostered days only.	8.4 — accommodation assistance subsidy — $134 per week. 8.6 — financial advice from a properly accredited financial adviser; limits apply. Resource assistance for employees— reasonable costs associated with the use of a bargaining agent/representative collectively elected by employees other than the union(s).

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
			Health and welfare advice — paid facility of health diagnostics immediately upon engagement and annually thereafter. Subsidised accommodation — $25 shall be deducted from employees for each week worked for provision of accommodation and meals. 14.2 — Funeral benefit — $5 000 on account of any deceased employee.
Functions, tasks and skills			
Functions	13 — union activities — monthly paid union meetings provided that CHPP continues to operate and train loading will be maintained if required. National and district representatives allowed to enter the workplace provided that they meet provisions under the *Workplace Relations Act 1996* and the *Coal Mines Regulation Act 1982*. Employees elected as Lodge Officials will be recognised as representatives of the union and, upon approval by the Company will be allowed reasonable time to carry out their duties and be granted paid leave to attend union meetings and/or TUTA training. National CFMEU campaigns will exempt Stratford where the issues do not directly concern the site. Appendix G — delegates attendance at meetings — during delegates' normal shift	11 — monthly union meetings — where monthly union meeting is to be held will be arranged to minimise interference with operations. Where practicable, will be held outside working hours. Where unavoidable for meetings to be held in working hours, no deduction of pay unless meeting extends beyond 2 hours.	21 — right of entry — union officer duly authorised by the National Secretary entitled to enter premises provided that he has permission of the General Manager — Mine; the officer reports to the authorised representative, entry to Ensham is for the purpose of interviewing members of the union or inspecting employment records for members of the union, the officer does not hinder or obstruct any person in the performance of their work; and the officer exercises every care to preserve the privacy and confidentiality of any information gained during entry granted under this clause. Right of entry may be withdrawn if any clause is breached or if the officer's methods are offensive. Clause shall not impede the registered manager of the mine from complying with statutory obligations pursuant to the *Coal Mining Act (Qld)*.

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
	no loss of pay, two delegates' to attend monthly delegates meeting in Cessnock, and company-called meetings outside the delegates normal working shift attendance paid at normal penalty rates, such hours in addition to usual weekly limits on overtime. CHPP delegates' only required to attend union meetings concerning matters affecting the CHPP.		26 — union membership — Ensham employees may be members of the AMWU, CFMEU or CEPU.
Job and task demarcation	Appendix A — Stratford work model. Provides for production and engineering streams, no demarcation within streams. Three levels: induction, experienced and advanced. Progression to advanced level is by appointment by the company, and may include statutory functions and appointments.	4 — flexibility of operations — demarcation exists between production and engineering streams. 2 levels (mineworker and co-ordinator). Scope to integrate production and engineering skills around the Coal Preparation Plant and Train Loading facilities.	10 — schedule of skills— reduced number of levels compared with Award. Five levels (Level 4A to Level 1). No demarcation between production and engineering streams. Progression from Level 4A to Level 2 is via acquisition of additional agreed skills. Progression to Level 1 is by appointment.
Training	Appendix A — work model. No loss of pay to occur when training is carried out during normal shift time. Travelling time in excess of normal work requirements to be reimbursed. Workers' compensation insurance during any such travelling will be maintained for the term of this agreement.	10 — first aid/fire training — all employees can be required to attend Rescue, First Aid and Fire Fighting training outside normal working hours. Counted as non-rostered overtime.	No provision.
Qualifications	No provision — see Award.	No provision — see Award.	No provision.

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
Procedural arrangements			
Relationship with Award	3.5 — Agreement replaces P&E Award and all other Awards and Agreements including site agreements previously applicable to Henry Walker employees at the Stratford Mine.	P&E Award applies where agreement is silent.	2 — Agreement sets out the provisions and entitlements of employees employed under terms and conditions of this agreement at the Ensham Mine. No other Award or Agreement shall apply to such employees.
General	31 — salary-sacrificing — agreement to explore salary-sacrificing arrangements with intention of benefiting both parties to the Agreement.		
Dispute settlement	5.7 — dispute settlement procedure for unfair dismissals — same as Award. 16 — disputes procedure — same as Award except step 3 of the Award procedure (where the union representative at the mine meets with the mine manager) is omitted. In addition, a 48 hour cooling off period applies before the dispute is referred to the appropriate industrial authority. Work continues under prevailing conditions prior to the written notification of the dispute. Where the conditions themselves are disputed, work to continue without prejudice and in accordance with the reasonable direction of the Company, the employees' recognised skills and safe working practices.	15 — dispute resolution and consultation. Discussed initially between immediate parties (employee and relevant supervisor). If not resolved, union representatives to confer with senior management. Where matter remains unresolved it shall be referred to the appropriate industrial authority. After speaking with the supervisor, an unsatisfied employee may address the issue in writing. The head of the employer's Queensland mining division to respond within 7 days of the receipt of the query. Changes to the organisation of work to be discussed through the above process at a level appropriate to the issues involved. Parties agree to take all possible steps	23 — disputes avoidance procedure — 4 step process: Step 1 — matter discussed and investigated in first instance between employee and the employee's co-ordinator. If unresolved; Step 2 — investigation and discussion referred to Department Manager for further discussion. If unresolved; Step 3 — matter referred to a representative nominated by the employee, and the General Manager-Mine for further discussion (includes initiator of grievance / Co-ordinator / Department Manager and the employee's nominated representative). If unresolved; Step 4 — matter referred by Ensham, the employee or the employee's representative to the AIRC for resolution. Status quo existing prior to the dispute remains. Until dispute avoidance procedure has been completed, work will proceed

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
		to avoid industrial action from disputes concerning Burton-specific issues.	without stoppage or the imposition of any ban, limitation or restriction.
Agreement making	3.3 — parties undertake to commence negotiations for a replacement agreement 3 months prior to the expiration of the Agreement.	14 — agreement to remain in effect while a replacement is negotiated.	25 — variation of the agreement — any term may be varied by agreement of a majority of persons subject to a number of conditions. Limits on which clauses may be varied during life of Agreement. Agreement shall be binding on any successor to, or assignee or transmittee of, the business, including any Corporation which acquires or takes over the business.
Negotiating change	33 — variations to the agreement — agreement may be varied by consent of both parties and ratified by the AIRC.	No provision — see Award.	24 — joint consultation process — to be followed where the parties wish to vary any of the items listed in clauses. 24.1 — meetings held with employees covering all shifts (four meetings required), at which all employees will have the opportunity to discuss any matter relating to any changes to the organisation, safety issues or performance of work. Meetings held at shift changeover time. Meetings are the mechanism for establishment of any further consultative groups where required.
Redundancy	26 — retrenchment and severance pay — same as Award except: 4 weeks' notice of impending retrenchment and a minimum of 3 weeks' pay (at the rate of 8.5 ordinary	No provision — see Award.	No provision (no forced retrenchments during life of agreement).

Type of arrangement	*Stratford*[a]	*Burton*[b]	*Ensham*[c]
	hours) per year of service; accrued sick leave at the time of retrenchment will be paid at the rate of 8.5 ordinary hours for each day; and accrued annual leave at the time of retrenchment will be paid at the rate of 8.5 ordinary hours for each day.		
Payment of wages	10 — same as Award except that wages paid by EFT fortnightly on a Friday into an account(s) nominated by the employee. Company will maintain deductions for employees. Statement issued to employees on a day prior to pay day detailing total amount of wages and deductions.	No provision — see Award.	8.2 — same as Award except that wages paid fortnightly by EFT no later than Friday of the second week of each roster cycle to a maximum of 2 accounts. Prior to each pay day a statement detailing amount deposited to be issued or mailed to each employee. Upon termination, salary due to employee to be deposited to employee's nominated account on the day termination takes effect, or on the next day if the institution is closed.
Safety management	No provision — see Award.	No provision — see Award.	No provision.

a Agreement binding on Henry Walker Contracting Pty Ltd and its employees who are members of the CFMEU and is defined by the terms and conditions of the Mining Contract that Henry Walker Contracting Pty Ltd has with the owners of the Stratford Coal Mine. Two year agreement expiring on 17 August 1999 unless varied or extended by agreement.

b Agreement between Thiess Contractors Pty Ltd and the CFMEU. Agreement from 2 February 1996 to 1 December 1997.

c Agreement binding on Ensham and employees as defined and the Automotive, Food, Metals, Engineering, Printing and Kindred Industries Union (AMWU). Three year agreement expiring on 23 November 1998. Provision to vary Clauses 7, 8, 16, 18, 22, 23 and 24 if agreement to extend the operation of the Agreement.

Table G.2: **Overview of formal work arrangements in recent black coal mining agreements: Muswellbrook, Southern Colliery and South Bulli**

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
Size of the work force			
Recruitment	21 — no provision giving preference to unionists in recruitment. Award provisions substituted with a statement acknowledging the role of unions at the workplace in promoting good industrial relations practice. Time also given for union reps to address new employees and the company has agreed to provide a simple means by which employees can pay union dues. 27 — preference to former employees who were retrenched and those who apply to be re-engaged in order of seniority in respective class of work — same as Award (for NSW mines).	Clause 10 — selection and recruitment of employees conducted in accordance with procedure contained in Appendix 1. This provides for the following steps: employment requisition and specification; written advertisement; assess applicants' responses; conduct screening interviews; conduct targeted selection interviews; assess results; selection process; reference checks; advise union of preferred candidate(s); candidate and family to visit site, town, accommodation; and job offer and medical. Preference given to unionists as per clause 22 of the Award. If this practice is found to be discriminatory by the AIRC, preference will not necessarily be given. 10.2 — Consultative Committee to review procedure.	No provision — see Award.
Retrenchment	25 — 'last to come, first to go' provision — same as Award. 38 — guarantee of employment — during the life of the agreement, no employee is to be subject to forced retrenchment.	14.7 — 'last to come, first to go' provision — same as Award. However, 'last to come, first to go' shall be subject to all other things being equal and the *Industrial Relations Act 1988* (Cth) as amended.	No provision — see Award.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
		14.2 — Intention of the parties that there shall be no forced retrenchments during the term of this agreement. Employment levels may be reduced through natural attrition and / or through a voluntary redundancy program.	
Dismissal	5(d) — employer dismissal rights — same as Award. 5(e) — unfair dismissal — same as Award. 5(g) — prior to summary dismissal of employee under 5(d), employee to be stood aside with pay until an urgent meeting is convened between employer and union representatives.	15(1) — employment may be terminated by the provision of one month's written notice. 15.5 — subject to provisions of the *Industrial Relations Act 1988* as amended.	No provision — see Award.
Use of casuals, contract employment and contractors	42 — parties acknowledge need for contractors but recognise need for prior consultation and notification of contractors on an agreed basis. Employer must make contractor aware that the employees must be financial members of the appropriate union and, where applicable, a register is to be filled in on arrival and departure of contractor. In event of dispute, joint working party to resolve. If not resolved then disputes process to be invoked. Rates of pay: Production and Engineering $606.58 (inclusive of $28 tool allowance). If bonus pay is applicable rate to increase by $28.	12.1 & .2 — temporary labour may be employed to cover peak work, or to cover unforeseen labour shortages for a period not exceeding six months. Prior to employment of temporary labour discussions will take place within the self-managed work group. 23.1 & .2 — work deemed necessary or desirable according to good business practice, efficiency and cost effectiveness may be contracted out. Discussions shall take place within self managed work groups to determine peak labour requirements and scheduling.	21 — use of contractors limited to circumstances where there is a lack of expertise amongst existing work force or where specialised equipment is required or time limits require the use of contractors. Details type of notification to be provided to the union depending on the type of work to be performed. Terms and conditions of contractor employees are, except where provided for by this Agreement, determined by relevant Award/agreement. Contractor employees shall be paid an ex-gratia payment equivalent to the district average bonus, be members of the appropriate union, have superannuation

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
			paid into Coal Super. Where additional labour is sought by the contractor, consideration will be given to retrenched mineworkers who possess the skills required for the work.
Manning levels	43(c) — manning and allocation of labour: (1) Engineering and Production employees divided into four crews with equal spread of skills on rotating shift basis; (2a) Shotfiring crew of 3 personnel, 2 being Shotfirers and 1 being Trainee Shotfirer, to work a permanent day shift roster; (2b) Trainee Shotfirer after training and accreditation to undertake a period of 12 months' work as an appointed Shotfirer to fully develop competencies; upon completion of 2b, person to return to Production roster and then the position of Trainee Shotfirer to be advertised internally at the mine; (3) day to day allocation of employees will attempt to give all employees varied access to their skills and training while bearing optimum production requirements in mind; (4) employee's accredited skills to be utilised at least once every 3 months to maintain accreditation; (5) Engineering workers to work in all areas of the mine; (6) Employee assigned to Bathhouse duties shall utilise other skills if required during the course of the shift (but not at the expense of the cleanliness of the bathhouse).	No provision — see Award.	29 — allocation of manpower on each shift between panels, longwall, and servicing outbye at the discretion of Shift Undermanager according to work priorities and effective achievement of production plans. Utilisation and deployment is based on skills, competence, training and operational requirements. Minimum manning levels for longwall and panel manning. Fitter may be allocated to further work, either underground or on the surface, depending on work priorities after completing surface mechanical work. No overtime coverage for surface fitter on weekends unless required for a specific task. Order of preference for statutory surface electrical coverage. An engineer may only be used where a surface electrician or failing that an electrician is unavailable.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
Hours of work and roster arrangements			
Contract of employment	5 — same as Award except 5(g) — provision for employee to be stood aside with pay prior to summary dismissal pending meeting between employer and employee representatives.	9 — same as Award except employment by the month.	4 — same as Award.
Ordinary hours	6(a) — 35 hours per week — same as Award.	19.1 — 35 hours per week — same as Award.	5 — 35 hours per week — same as Award.
Part-time hours	No provision except after maternity, paternity or adoption leave — same as Award.	No provision — see Award.	No provision — see Award.
Overtime hours	11 (b&c) — reasonable overtime and rest period after overtime — same as Award. Additional clause — if more than 14 consecutive hours is worked on a Sunday then the employee is entitled to a 10 hour break.	21.1 & 21.2 — additional hours and 10 hour rest period after working additional hours — same as Award. Additional clauses 21.3 to 21.5 — an employee is not to receive additional payment for additional hours worked. An employee recalled to work outside rostered shift will have rostered hours reduced by an equivalent amount or, by agreement, can take equivalent time off in lieu. A meal is to be made available to the employee if he was not informed the previous day of the requirement to work additional hours.	5 — average of 5 hours overtime per week in roster. 11.3 — 10 hour break to be provided between work of successive days Monday to Friday and 8 hour break Saturday and Sunday.
Shift arrangements	6 — shift length hours, number and spread of shifts, starting and finishing places, rosters and rostered day off — same as Award.	19.2 — Shift lengths of up to 9.5 hours may be rostered by the company where necessary for ensuring continuity of operations through a changeover or hand over of work on the job. Other shift	5.5 — Employer may determine shift length up to a maximum of 8 ordinary hours. Shift lengths in excess of eight hours can only be implemented by agreement.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
		arrangements — same as Award.	26 — shift swaps among similar or same skilled employees and make up shifts are allowed in rare and unusual circumstances which cannot be covered by other forms of leave. Provisions include that no additional cost is borne by the company, the shift swapped is made up the shift before or after the rostered shift, and 24 hours' notice of a swap is provided. 27 — shift changes are determined according to seniority. Where there are no applicants the vacancy will be filled by the most junior person for a move backwards, and the most senior person for a move forwards.
Roster arrangements	6(e) — employee's place on roster — same as Award.	22 — work performed on a rotating shift roster. Roster provides continuous five day Monday to Friday coverage and includes weekend coverage of necessary shifts. An employee can be moved from one shift in the roster to another on the provision of 24 hours' notice. Work other than day shift to be performed on the weekend shall first be discussed with the Consultative Committee.	5 — Rostered hours shall average 40 hours per week. A rostered shift is 8 hours, comprising 7 ordinary plus 1 hour at overtime rates. 30.6 — work roster patterns as required from time to time after discussions with the local executive.
Paid breaks	7 — crib time — same as Award. 11(e) — crib breaks for those on 7 hour or greater shifts — same as Award.	20 — 30 minute paid crib break during each shift. Crib to be taken so as not to disrupt continuity of production throughout the shift and the safe	7.3 — Work Through Crib — $8.50 payment made at discretion of undermanager or engineer where crib cannot be taken at employee's

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
		operation of Southern Colliery. Employee recalled to work to receive paid 30 minute break within the first two hours of commencing work unless agreed otherwise. Other provisions same as Award.	convenience during a shift. Other provisions same as Award. Discontinued if becomes a daily occurrence and conditions attached are not fulfilled. 30.3 — practice of 10 minute 'smoko' at beginning of each shift will be replaced by a refreshment break consistent with the job at hand and which does not hinder continuity of operations. 30.4 — Crib breaks will be organised in work teams as will the method of taking them to ensure continuity of operations.
Annual leave	14 — conditions same as Award. 14(f) — maximum of 5 single days allowed if arranged and ratified by Senior Mining Official so as not to impede production.	15 — Provisions similar to Award. Entitlement of 17 shifts for 5 day pattern of work or 21 shifts for 7 day pattern of work. Proportionate leave to accrue in line with Award. To be taken in consecutive shifts within a year of falling due, unless agreed otherwise.	14 — Provisions similar to Award except: period of five weeks' annual leave for Monday to Friday employees or employees engaged under a roster that does not require them to work recognised holidays or 34 Sundays per year; leave taken in accordance with the leave roster upon the provision of four weeks' written notice and management believes the granting of leave will not affect the operations of the mine. 13 — allocation of annual leave — introduces minimum leave slots on each shift and for each classification during the year. Additional slots

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
			available when circumstances allow and in extenuating circumstances. Allocation on a first come first served basis. Written confirmation of application will be provided. Allocation of available leave slots during peak periods will be managed by employees and their representatives.
Long service leave	19 — entitlements and conditions — same as Award, except — 19(b) — interruptions of more than 3 months of employment in coal industry shall not count as service.	29 — entitlements same as Award.	13 — allocation of long service leave as for annual leave.
Sick leave	15 — entitlements same as Award. In addition: employees are asked to contact their supervisor prior to being absent on sick leave; first 5 days of sick leave can be used with sick leave declaration form, the balance must have certification of proof. More than 2 consecutive days requires certificate; and policy adopting a 4 stage procedure to address unacceptable patterns of absenteeism.	26 — entitlements same as Award. In addition: where practicable an employee shall inform the employer of inability to attend for work, stating the nature of the illness or injury and the estimated absence prior to the next rostered shift. An employee shall prove to the satisfaction of the employer that such absence was due to illness or injury.	15 — entitlement same as Award but may also be used for personal leave. In addition: where practicable an employee will notify the employer of a sick leave absence and estimated date of first shift back at least 45 minutes prior to the commencement of the shift; sick leave claimed on the day before or after a statutory holiday or a known strike requires production of a medical certificate; employees with 3 or more years' service and with a credit of 10 or more days' unused sick leave may receive 7 ordinary days' pay for each day's credit upon termination for reasons other than misconduct; accrued sick leave balances may be paid into the Coal Superannuation Fund; up to 5

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
			days' sick leave may be used for personal business; applications for personal leave made 2 weeks in advance will be automatically approved. In addition applications made less than 2 weeks but more than 48 hours in advance will be approved provided the operation of the mine will not be affected.
Parental leave	30 — maternity, paternity and adoption leave — same as Award.	30 — unpaid maternity, parental and adoption leave — same as provided in the *Industrial Relations Act 1988.*	No provision — see Award.
Other leave	13 — public holidays entitlements and conditions — same as Award. 16 — special family leave — same as Award. 17 — jury leave — same as Award. 18 — bereavement leave and pressing domestic need leave — same as Award.	31— public holiday entitlements and conditions — same as Award. 27 — compassionate leave — same as Award but excludes step child. 28 — jury leave — same as Award except that company pays employee normal salary provided the employee forwards to the company such amount they are paid for jury service. The employee is not paid where he attends jury service on a day on which he is not rostered to work. 32 — Trade Union Training Authority (TUTA) leave — company may grant up to 6 days' paid TUTA leave per year. 33 — Leave to attend local council meeting — an employee who is a member of the local council may have up to a total	16 — compassionate leave — same as Award. 17 — jury service leave — same as Award. Where no provision — see Award.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
		of 2 shifts per month off work to attend local council meetings without loss of pay. 34 — Defence Force Reserve Leave— an employee who is a member of the Defence Force Reserve may be granted up to a maximum of 16 consecutive working days each year to attend the annual camp. 40 — AIRC proceedings and state conferences — up to 2 accredited representatives may attend the hearing/conference where the company has submitted the application and the district office of the union requires their attendance. Reasonable travelling time included.	
Remuneration and on-costs			
Base pay	Appendices A&B — two streams — production and engineering and 2 classifications — induction ($606.84 per week) and production or engineering worker ($707 per week). Apprentice pay — same as Award except for 4th year apprentice (higher pay in agreement). Youth pay — same as Award. No mixed functions provision. Apprentice and youth provisions — same as Award.	16.1 — employees receive an annual salary paid in recognition of the performance of work in accordance with the roster annexed to the agreement as Appendix 2. The annual salary increases after 12 months and 24 months. Salaries: $71 200 upon certification; $73 692 12 months after certification; $76 271 24 months after certification 16.2 — The annual salary excludes Award clauses dealing with: hours; crib time; wage rates; overtime; afternoon and night shifts; Saturday, Sunday and	6.1 — Majority of classifications applicable under the Award are eliminated. Classifications are grouped into five gradings with weekly wages as follows: Group A — $543.50; Group B — $556; Group C (2 years' experience) — $570; Group D (Special Class) — $598.60; Group E (Washery) — $576, $590 and $618.60. Agreement includes increase of $7 to apply as of 30 September 1996. Rates contain the third $8 safety net adjustment.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
		holiday work; and transport.	6.3 — National safety net wage increases are offset against wage rates contained in the Agreement and gain share amounts.
Overtime pay	11 — rates — same as Award. 11(c) — paid at double time if resume work prior to 10 hours rest after overtime — same as Award. 11(d) — overtime paid at minimum of 4 hours for call back — same as Award.	16.3 — An employee required to perform work in addition to that necessary to satisfy the roster which is annexed to this agreement (unrostered overtime) shall receive time off in lieu on an hour for hour basis.	Similar provisions to Award. In addition: 11.3 — overtime must be organised so that where reasonably practicable employees will receive a 10 hour break between Monday to Friday and an 8 hour break Saturday and Sunday. 11.5 — An employee required to work after completing rostered shift will automatically receive a meal allowance. If working longer than 4 hours employees supplied with a meal and a paid crib break. 30.2 — volunteers working 2 hours beyond rostered shift finish time are paid a mini shift payment. Work in designated areas will go to volunteers from that area.
Shift pay	12 — shift rates — same as Award. 8 — additional shift pay — same as Award.	See base pay provision.	18 — shift work and shift allowances — same as Award, except: employees working continuous overtime on afternoon and night shift shall receive a shift allowance of 10 per cent of their appropriate hourly rate. Employees commencing overtime on afternoon or night shift on the weekend shall be paid

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
			a shift allowance equal to 10 per cent of the hourly rate. 7.5 — mini shift payment — paid to employees who volunteer to continue work for two hours following their rostered shift finish time. [Production — $60 and Engineering — $63.] Amounts increase by $3 on September 30 1996. Further increase equivalent to CPI payable to Production employees, while Engineering increases by $3 and CPI on March 31 1997.
Weekend pay	13 — same as Award.	See base pay provision.	12 — same as Award.
Annual leave pay	14(n) — change in annual leave accrual rate from 3.3654 hours for each completed week of service in Award to 3.846 hours in agreement. Otherwise rates are same as Award.	25 — 5 weeks' annual leave paid at normal salary. In addition, on termination an employee is to be paid for untaken annual leave at the weekly base rate specified for level 4.6 of the underground work model contained in the Award as at the date of certification plus any national CPI increases which may occur between that date and the date of termination.	14 — 5 weeks' annual leave for employees working Monday to Friday or on a roster that does not require them to work on recognised public holidays or 34 Sundays per year. Paid the greater of their projected 42.5 hour roster or 120 per cent of their ordinary rate.
Bonus pay	36 — Bonus agreement to continue from previous agreement. 37 — Budget cost saving scheme: employee share in annual payment (being the difference between budget cash costs and actual cash costs) proportioned on the basis of labour costs to total costs. Amount to be divided by the	17.1 — employees shall be paid a bonus in accordance with the Bonus Agreement. 17.2 — employees shall have the opportunity to participate in any changes to Bonus Agreement during the Enterprise Agreement's term through the Consultative Committee.	8 — South Bulli bonus — consists of two components: weekly development metres advance and weekly longwall retreat metres. Bonus is paid for paid annual leave, paid sick leave, personal business leave, approved union business and other authorised paid absences.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
	number of employees at the mine and paid after the end of March each year.		Bonus is not paid for any other absence. Average bonus is paid for people working during a formal shutdown period where no production is planned and those not required to work are paid the appropriate leave bonus. Upon approval of 20 or more employees, an amount between 10 per cent and 100 per cent of weekly bonus may be paid into CoalSuper. 9 — performance improvement and payment — series of annual performance targets to be set and additional payments attained upon their successful achievement. 7.2 — Continuous Production Payment — $28 subject to achievement of quarterly targets set by Mine Manager. Paid to employees directed to maintain continuous work which prevents taking of a crib break during the shift. Payment discontinued if becomes a daily occurrence without the attached conditions.
Workers' compensation	No provision.	No provision — see Award.	No provision — see Award.
Sick pay	15(g) — same as Award. In addition: 15(j) — on termination, retrenchment or death, unused sick leave of 10 or more days is paid at rate of 8 hours of ordinary pay (cf 7 hours in	26.9 — On termination, retrenchment, death or resignation an employee with more than ten day's accrued unused sick leave shall be paid for the accrued sick	No provision — see Award.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
	Award) plus payment of a day's average bonus as per annual leave calculation for each accrued sick days leave he/she is paid.	leave at the rate of $148.40 per day.	
Accident pay	29 — entitlements and conditions — same as Award.	No provision — see Award.	No provision — see Award.
Superannuation contributions	39 — provisions of the *Coal and Oil Shale Mine Workers (Superannuation) Act (NSW)* and the *Occupational Superannuation Industrial Agreement (CIT 17 June 1986)* to apply to employees under the agreement.	No provision — see Award.	No provision — see Award.
Severance and retrenchment pay	26 — entitlements — same as Award. 15(2) — retrenchment — an employee over the age of 45 who has completed at least two years' continuous service with the company shall be entitled to an additional weeks salary.	No provision — see Award.	No provision — see Award.
Special rates and allowances	8 — special allowances — reduced number compared with Award, paid at same rate as Award. (Includes: first aid officer, first aid attendant, heat allowance and damage to clothing and tools.) Tool allowance $28 per week (cf $7.34 in Award).	See base pay provision.	7.1 — weekly allowances — payable in compensation for all disabilities and special conditions encountered in activities undertaken at South Bulli: Inbye — $50 (Production) and $72 (Engineering); Outbye — $30 (Production) and $50 (Engineering); Surface — $20 (Production) and $30 (Engineering); Washery — $28.80 (Production) and $28.80 (Engineering). 7.6 — other allowances — daily allowances: First aid officer — $3.40; Advanced resuscitation — $2.50; First aid attendant — $2; and Meal

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
			allowance — $4.80. Weekly allowances: Tool allowance — $8.30; Leading hand 3-10 — $12.09; and Leading hand 10-20 — $19.
Public holidays	13(f) — public holiday rates and conditions — same as Award.	31 — public holiday entitlements — same as Award. Rates absorbed into annualised salary.	12.4 — public holiday entitlements — same as Award except that only 9 public holidays specifically listed plus any gazetted holidays in Agreement as opposed to 10 in the Award.
Working clothes and safety boots	10 — same as Award plus payment equivalent to one industrial work jacket every 2 years.	11 — same as Award except that receive an additional set of outer clothes and a pair of gumboots per year and a winter coat every two years.	28 — same as Award plus hardening of prescription lenses for safety glasses. OH&S Committee to continuously explore and implement improvements in protective clothing and safety equipment.
Travel	28 — transport costs — same as Award.	No provision — see Award.	11.6 — employees working overtime in excess of 4 hours who were unaware prior to leaving home shall be supplied transport home. Transport shall also be supplied to overtime of less than four hours when circumstances beyond an employee's control prevent use of his own transport.
Training costs	43(d) — payment for training on a shift (other than normal rostered shift) to be paid at appropriate rate at ordinary hours.	No provision — see Award.	No provision — see Award.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
Other on-costs	17 — jury make-up pay — same as Award.	36 — accommodation assistance — terms and conditions of the Town rental and Single Accommodation Scheme shall apply to all permanent employees.	33 — death benefits — company to pay a funeral benefit of $225 to beneficiaries of deceased mine workers who qualify for funeral benefits from the Joint Coal Board welfare fund. Upon the death of a member of the south Bulli mortality fund $3 will be deducted from all fund members' wages to be paid to the beneficiary. For each $3 deducted the company will pay $1.50 to a maximum of $1500. The company will pay $25 000 to the nominated beneficiary of an employee who dies on or off site under certain conditions.
Functions, tasks and skills			
Functions	34 — stewards/lodge officer — same as Award.	38 — employee representatives — generally same as Award except that prior to leaving place of work to carry out duties as representative, employee must notify supervisor and the management representative of plans to meet. 39 — union meetings — to be held monthly on weekends to minimise disruption. Where the representative is required by the company to attend a meeting it will be without loss of pay. Unpaid leave may be provided for two accredited representatives to attend a meeting off site which does not involve the company. Written notice giving	24 — recognition of appointed representative similar to Award. Company to supply facilities for use by representatives. A half day meeting to occur between Lodge and company once a month to resolve problems. Lodge committee allowed one day per month to meet. Lodge executive allowed 35 days' paid leave per annum to cover union business. Four days' paid TUTA leave for elected representatives in their first year of election other than members of the Lodge executive. Paid leave for a maximum of 2 employees to attend consent matters at industrial tribunals.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
		reasons must be provided.	Employee representatives to notify company of absence due to union business 48 hours prior to absence. Employee representatives to notify company as soon as practicable of issue(s) affecting operation of Bellambi Collieries, including means to mitigate effects of issue(s). Company seeks and expects exemption from industrial action on issues addressed in the Agreement. 25 — Maximum of 1.5 hours paid at time and one half is available per month for union meetings, provided company is supplied with 24 hours' notice, production is maintained, shifts do not reach pit bottom earlier than 17 minutes prior to the expiry of the meeting time, and a maximum of two meetings in the absence of extenuating circumstances. Company may address such meetings although such time will not be included in the 1.5 hours. Lodge executive to discuss with company a need for a full work force meeting.
Job and task demarcation	43 — work model: parties accept the need for flexible work practices and elimination of demarcation. Seniority to play no role in the day to day allocation of an employee to a task contained in the employee's skill bank.	11 — employee career path established.	No provision — see Award.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
Training	Appendix A — Production workers to have complete induction training and agree to train in 3 of the 11 main skills and any of the 8 ancillary skills as appropriate. Appendix B — Engineering worker to have completed induction and agree to train in all 9 mechanical skills or all 7 electrical skills and any of the 8 ancillary skills as appropriate. 43 — aim of work model to have the work force trained in as many skills as is practicable for the operation of the mine. In-house accreditation of skills acquired, where appropriate.	No provision — see Award.	22 — affirmative action — all employees to participate in affirmative action education. 34 — environmental training for all employees on how the environment is affected by their work and measures to prevent or mitigate these affects.
Qualifications	No provision.	No provision — see Award.	No provision — see Award.
Procedural arrangements			
Relationship with Award.	Agreement supersedes the P&E Award and any other Awards or agreements applying to employees under the agreement.	Agreement is read and interpreted in conjunction with the P&E Award. Where there is any inconsistency between the agreement and the P&E Award the agreement shall prevail.	The Agreement replaces and / or sets off the provisions of the P&E Award to the extent of the inconsistency between P&E Award provisions and the clauses contained in this agreement. Where there is no mention of an Award provision, the appropriate P&E Award clause still applies.
General	No provisions relating to maintenance of custom and practice at mine.	No provision — see Award.	30 — introduces new work patterns to ensure continuity of operations. Appropriate mix of skills required for overtime will be nominated by the company. The first wind will be 15 minutes to the hour.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
			35 — all previous custom and practice, except the arrangement for payment of double bonus on long service leave, ceases from the operative date of the Agreement. Future custom and practice is not binding on the parties unless agreed in writing and incorporated in the Agreement.
Dispute settlement	20 — dispute settlement process — same as Award.	8.1 — while dispute procedure being followed, work shall continue normally and without interruption. Continuance of work shall not prejudice the final settlement of a dispute. 8.3 — same procedure as Award but eliminates third layer of Award dispute settlement, whereby site officials of the union discuss the matter with senior representatives of the company prior to the involvement of district officials of the union.	19 — corrective action procedure — unacceptable levels of work performance or behaviour will be subject to a specified process of corrective action. 20 — grievance and dispute resolution — same general procedure as Award. In addition, grievance forms are to be completed during stage 2. Safety disputes procedure is outlined, similar to general disputes procedure. During dispute, work proceeds under existing conditions; however, where those conditions are disputed, work shall continue in accordance with the reasonable direction of the employer, the employee's recognised skills, competencies and training and safe working procedures. Procedure does not interfere with disciplinary action taken under Award contract of employment clauses. Also includes provision for

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
			payment for time spent on resolving grievances. Cooling-off period: where safety or industrial dispute arises which may give rise to industrial action, either party may invoke a 24 hour cooling-off period. No industrial action is to occur until total available union membership is balloted after 24 hour-cooling off period. 22 — affirmative action — dispute resolution procedure to process any disputes relating to equal opportunity or affirmative action. 32.3 — Lodge Executive to inform their members of the appropriate person to speak to, ensuring that grievances are resolved as close as possible to the source of the problem. Lodge Executive to take action to ensure that grievances are solved outside of their regular monthly meetings.
Agreement making	4(e) — agreement binding upon any successor to the business. 40A — mid term review process — 2 months prior to mid term of agreement, parties to meet and discuss effectiveness and any necessary changes. 40B — agreement review process — prior to expiry of agreement, joint working party to meet and exchange views on success of	4.2 — parties may agree to extend the agreement beyond its initial term of three years upon a review of the agreements performance. 4.3 — six months prior to the expiry of the agreement the parties shall meet to discuss whether or not a further agreement is appropriate. 41 — review of agreement — parties	No provision — see Award.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
	agreement and whether the aspirations of employers, employees and unions have been achieved. Details of options to be discussed and process to reach agreement over implementation of options on expiry of agreement.	shall continuously review the performance of the agreement and monitor adherence to its terms.	
Negotiating change	22 — right of entry to unions — similar to Award provisions but AIRC no longer required to issue authority. 23 — introduction of change — same as Award but no provisions on establishment of boards of reference.	7 — Southern Colliery Consultative Committee — a prime function of the Consultative Committee is the facilitation of communication and the exchange of information at Southern Colliery. Comprises two members of management and two employee representatives who are members of the union. Similar mechanisms involving employees shall be used to undertake specific assignments as required.	31 — Bellambi Collieries Monitoring Committee — purpose is to ensure that the mine is self funding. Committee to oversee the performance of the mine including the operation of the agreement. To meet monthly and will assist in solving problems affecting mine performance or operation of the agreement. Minutes taken and distributed to work force. 32 — communications — meetings convened every 4 months to present information about South Bulli to the work force, a weekly newsletter to provide up-to-date information to employees regarding mine production and maintenance plans and performance. Company management agrees to be visible. Communications provided to Lodge Executive before attaching to payslips. Employees are expected to provide Lodge Executive with a wide mandate to discuss a broad range of issues with the company.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
Redundancy	5(h) — notice of termination by employer depends on length of continuous service and age. 24 — redundancy process — same as Award.	14 — employment security — generally same redundancy process as Award (that is, obligation to hold discussions with employees and union); however, the practice of last to come, first to go is subject to any relevant provisions of the *Industrial Relations Act 1988* and all other things being equal.	No provision — see Award.
Payment of wages	9 — generally same as Award except that pay day not necessarily on a Friday as stipulated in Award and payment only by electronic funds transfer (EFT). (Cheque option was available in Award.)	18 — paid monthly by EFT into a maximum of three bank accounts. Must be paid by the 25th day of the month.	10 — paid every Thursday by EFT into a maximum of four accounts. Can extend pay period by the agreement of a majority of employees. Upon request and for a minimum of 20 employees per institution the company will electronically transfer funds and dues to superannuation funds, the union and medical benefit funds.
Safety management	41 — OH&S — includes statement that all employees accept responsibility for safety of activities under their control and acknowledge their prime responsibility for protecting themselves and their fellow workers from injury and for maintaining plant, equipment and working environments in a safe condition. Condition of employment that employees comply with specified regulations and policies.	35 — Provisions of the *Workers' Compensation Act* 1990 (Qld) as amended shall apply to the parties. 24 — performance testing — impaired performance testing procedure established to determine whether employee impaired due to consumption of alcohol; side effects of medication; personal stress/disorientation or any other factors.	23 — establishes an OH&S Committee representative of the entire work force. Employee participation in safety meetings, audits, accident and incident investigations, developing and writing safe work procedures, paid safety training and reporting unsafe acts and conditions. Provision of resources by the company for OH&S.

Type of arrangement	*Muswellbrook*[a]	*Southern Colliery*[b]	*South Bulli*[c]
		Provision for medical examination. Impaired employees may be immediately removed and appropriate action initiated in line with existing procedures.	

a Binding on Muswellbrook Coal Company Ltd and its employees Muswellbrook No. 2 Open Cut who are members of the CFMEU (UMW Division) and the AMWU. Two year agreement, expiring March 1999.

b Binding on Capricorn Coal Management Pty Ltd and the AMWU and its members employed by the company at Southern Colliery. Three year agreement expiring on 3 June 1999.

c Binding on Bellambi Collieries Pty Ltd, the CFMEU (the parties) and employees of South Bulli Colliery who are members of the CFMEU. The Agreement comes into force 10 July 1996 and expires 31 March 1998.

Table G.3: **Overview of formal work arrangements in recent black coal mining agreements: Crinum and Oaky Creek**

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
Size of the work force		
Recruitment	Appendix 4 — Employee Recruitment Procedure. Merit based. Applicants from retrenchment list and BHP Coal employees seeking a transfer also follow recruitment procedure. Selection process comprises 6 Crinum people who will be trained in Targeted Selection interviewing techniques. Also tests for aptitude, literacy, numeracy and comprehension tasks. Three standard format reference checks will be made before any person is offered employment. Candidates reaching the final stages of the selection process required to undergo a Coal Board medical examination.	11 — Employment Medical Examinations — provision for pre-employment medical examinations for prospective employees in accordance with Queensland Coal Board regulations. Provision to test existing employees at direction of Mine manager to ensure required level of fitness is maintained.
Retrenchment	7 — employment security — intention of the parties that there shall be no forced retrenchments during the term of this Agreement. If mine needs to downsize during life of the Agreement, consultation to occur between the parties on a program including voluntary retrenchments. Where reduction requires forced retrenchments, subject to legal obligations of the parties, it shall be implemented on the basis of 'the last to come, the first to go'.	No provision.
Dismissal	6 — contract of employment — right of the company to dismiss an employee without notice for refusal of duty, neglect of duty or misconduct is subject to relevant provisions of the *Workplace Relations Act 1996.*	

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
Use of casuals, contract employment and contractors	42 — Engagement of Contractors — lists tasks on which contractors will be engaged. Provision for Crinum employees to participate in projects carried out by contractors. Contractors engaged under Crinum Mine Maintenance and Minor Construction Agreement in Appendix 12. Appendix 12 — use of contractors determined by lack of expertise/skill in the local workforce, a need for specialised equipment, an urgency to complete work to maintain production or due to any safety requirement, cover peaks in production and/or maintenance and cost effectiveness.	19 — Use of Outside Contractors on Site — outside contractors may be employed in whatever work it determines. Such decisions at the discretion of the Company and nothing in this Agreement limits or qualifies the Company's right. No union right of veto but the Company to provide the site delegate with as much notice as possible. Where work ordinarily performed by Oaky Creek Underground employees, Company to include in conditions of contract the requirement that the contractor complies as a minimum with the terms and conditions of the Award or certified agreement that applies to it and its employees and that these are not less than the ordinary time weekly base rate specified in this Agreement. Contractors are not to be used to limit the access of employees to overtime, but may be used on weekends to avoid interruption to production or where it is convenient to arrange work on that basis. Contractors to be used for equipment and component overhaul and rebuilds, tradespersons employed by Oaky Creek are to be provided with assistance to upgrade their skills to keep abreast of technological changes appropriate to fault finding in plant and equipment serviced by them. Provision for uniform safety standards and statutory induction requirements to apply to employees and contractors. Provision for union access to contractors. Company to encourage contractor to employ casual or temporary labour from within the local community.
Manning levels	7 — employment security — agreed minimum numbers for the life of the agreement.	35 — provision for flexible manning arrangements. Allocation of manpower on each shift shall be at the discretion of the Shift Undermanager.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
Hours of work and roster arrangements		
Contract of employment	6 — same as Award except that in the case of a breakdown of plant or machinery, deductions from pay to only occur after breakdown has continued for more than five consecutive days (Award provides for four consecutive days). In addition, consultation to occur with CFMEU representatives concerning these significant breakdowns.	11 — same as Award.
Ordinary hours	15 — hours of work — 35 hours per week — same as Award.	12.1 — hours of work — 35 hours per week — same as Award.
Part-time hours	No provision — see Award	No provision.
Overtime hours	19 — generally same as Award. Employees shall be available to work reasonable overtime to ensure the continuity of production and the safe operation of the Mine and following the occurrence of significant events. 19.5 — callouts — does not include Award provision that an employee cannot be required to work the full four hours where specific job to be performed is completed in less than 4 hours.	17 — same as Award except that reasonable overtime may be extended in abnormal circumstances and the extent of such overtime shall not be subject to any industrial ban or limitation. Allocation of overtime shall be managed by the Company and allocated by the supervisor. Overtime to be offered without discrimination on the basis of union membership having regard to availability of individuals, the skills mix required for particular jobs, attendance of employees in the previous week and the fairness in the provision of equal access to overtime opportunities to employees. Provision to extend the number of jobs required to be performed in a recall where the work is essential and requires immediate attention or the employee was advised at the time of notification.
Shift arrangements	15.2 — shift length — set at: 8.75 hours for 5 day roster employees 9.5 hours for Section Coordinators 12.5 hours for Maintenance Coordinators. While these arrangements will be held in place for the duration of the Agreement, parties may implement alternative roster arrangements by agreement.	12.2 — shift work to be worked Monday to Friday. Upon the provision of a month's notice by the Company, a variety of shift work arrangements may be introduced, including shifts up to 12 hours duration, shifts extending over 7 days per week and rotating shifts. 12.3 — deputies required to work weekends as ordinary time shall work 12 hour shifts.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
	24 — swap shifts — provision to swap shifts. If an employee swaps a shift he must work the immediate preceding shift or the immediate shift following the rostered shift. Where request for swapped shift at initiative of Company, 8.75 hours to be worked in a single shift and employee to be provided with a paid ten hour break and transport.	12.4 — designated starting and finishing places for underground miners will be on the surface and employees are to be present at such places at the commencement time of their shift. 12.5 — the Company with the agreement of a majority of employees may substitute the rostered day off an employee is due to take for another day in the case of a breakdown in machinery or a failure or shortage of power or some other emergency situation. Provision for individual agreement. Appendix 6 — 14 day/3 week shift roster arrangements: Night Shift — 11pm–7am (Sunday-Friday) Day Shift — 7am–3 pm (Friday-Monday) Afternoon Shift — 2pm to 12 midnight (Monday-Thursday) Appendix 7 — 3/12 hour (Friday-Monday) rotating roster shift arrangements: Day Shift — 7am–7pm (Friday-Friday) Night Shift — 7am–7pm (Friday-Monday)
Roster arrangements	16 — Roster system 5 day rotating roster — provides continuous coverage from the commencement of night shift each Monday for a period of 120 ordinary hours and will be worked by engineering and production employees. Continuous Roster — maintenance coordinators appointed by the company. Six day roster — section coordinators and engineering mine workers. Changes between roster systems — change for a continuous roster employee shall be where possible at least 7 days. All other changes to 5 and 6 day roster employees can be made given reasonable notice. 20.7 — five additional production days per annum, whereby the	12.2 — an employee may be required to transfer to a different roster upon receiving not less than a week’s notice.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
	Longwall and two Development Units are operating. 'Hot seat' changes maintained. Days worked agreed by the production crew and the Company on a ten weekly cycle. 20.8 — provision for an additional fully manned Development Panel to work on the Longwall (where deemed necessary for safety reasons). Such 24 hour period to count as a nominated Production Day.	
Paid breaks	19.6 — provision for a meal to be supplied to employee after 4 hours' overtime. Award includes option of a meal break or payment.	18.1 — crib breaks same as Award for 7 and 8 hour shifts. 18.2 — 2 paid 30 minute crib breaks to be provided each 12 hour shift. Crib breaks to be taken before the 5th hour and the completion of nine and a half hours. If not taken before these times the employee shall be paid at appropriate rate of overtime between the due time for taking cribs and the time at which the crib is taken. 18.3 — provision for staggered cribs or otherwise taken as directed to ensure continuous operations. No provision for recognised smokos.
Annual leave	27 — generally same as Award with some differences. 5 weeks' annual leave for employees on a 5 day roster. 21 days (210 hours) for employees on a continuous 7 day roster. May be taken in unlimited periods providing one period is at least 3 weeks. Each area to maintain own roster for taking of annual leave to ensure that needs of the business and employees are complemented.	Appendix 5.5 — same as Award. Appendix 5.6 — Annual Leave/Long Service Leave Allocation — provision for such leave to be spread evenly over all crews/departments to alleviate unnecessary delays and consequent loss of production and bonus through reduced manning levels. Provision for management to allocate leave at their discretion.
Long service leave	28 — same as Award except that does not include provision for payment for retrenched miners with 6 years service unable to find further employment.	Appendix 5.4 — same as Award except that does not include provision for Union Officials – Credit for Prior Service.
Sick leave	22 — attendance — review of every employee's attendance record between the employee and their supervisor as an information and awareness exercise. 23 — unlimited sick leave provision. Abuse subject to a detailed	Appendix 5.1 — sick leave accrues on the basis of 120 hours per year for 12 hour shift employees and 105 hours for all other cases. Absences for less than half a day shall not be deducted. Accumulative without deduction. Employees to notify the Company

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
	4 step disciplinary procedure. Monthly review of statistics and provision for ongoing 6 monthly reviews with employees. 10 days of sick leave taken in 1 or 2 day lots with or without certificates over a 12 month period will result in a loss of Production Bonus for 12 months. Employees must notify supervisor of inability to attend at least 90 minutes prior to commencement of shift and then after every further 48 hours' absence; submit application for leave form; and provide medical evidence where required.	of their inability to attend to work at least 30 minutes prior to the scheduled commencement of work and shall produce satisfactory proof if required.
Parental leave	Parental leave and adoption leave — as per Part 6A Division 5 of the *Workplace Relations Act* and the Regulations (Schedule 14).	Appendix 5.7 — Parental leave — same provisions as Award except that no provision concerning effect of paternity leave on employment.
Other leave	25 — Family Leave — available for current partner; parent, principal carer, or parent in law; child or step child; other dependant relative; brother or sister; or a member of the employee's current household. Employees to notify area coordinator of inability to attend where possible 90 minutes prior to the commencement of their shift. Granted and paid at normal salary plus bonus subject to provision of medical evidence; the submission of an application for leave form; and leave of one day only up to an annual maximum of five days. In extreme circumstances a family leave application of more than one day but not more than five days in any one year may be approved by the Department manager. 26 — Bereavement Leave — same as Award except that reasonable travel time within Australia may also be granted. Must notify supervisor of inability to attend and likely length of absence as soon as possible. If additional leave is required, the employee should use other leave provisions.	28 — Jury Service — same as Award except that continues to receive salary subject to forwarding to the Company payments received for attendance. Appendix 5.2 — Special Family Leave — same as Award. Appendix 5.3 — Compassionate Leave — same as Award.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
	29 — Jury Service — same as Award except that continues to receive salary subject to forwarding to the Company payments received for attendance. 30 — Leave to attend local Council meetings — up to a total of 24 shifts per year shall be available to each employee who is a member of a local Council. 31 — Defence Force Reserve Leave— leave to enable regular training commitments and the annual camp. Applications to be made 4 weeks in advance. Employee to reimburse Company all payments received for attendance. A statement of earnings to be provided to the Company. Shorter periods to be met by using single days of annual leave. 33 — Unpaid permitted leave — available in special circumstances. Granted subject to permission of Area Coordinator and according to operational requirements.	
Remuneration and on-costs		
Base pay	10 — remuneration — current salary includes, and is in lieu of the following Award entitlements: ordinary weekly pay rate, rostered overtime, rostered holiday work, shift penalties and the Crinum allowance. 11 — Rates to increase by 2.5 per cent on the first Sunday after the commencement of the Crinum Agreement 1997; a further 2.5 per cent from the first Sunday after the first anniversary of the commencement of the Crinum Agreement 1997. If the Crinum Agreement is extended an additional year a further 2.5 per cent shall be payable from the first Sunday after the second anniversary of the commencement of the Crinum Agreement 1997. 12 — ordinary hourly pay rate, including 2.5 per cent increase after commencement of the Agreement —	13 — base rate of $580.70/week is for the purpose of calculating applicable rates for Youth Miners and Apprentices and for defining the minimum base pay applicable to contractor employees. Underground Crew Member (Tradespersons and Miners): $633.60 Deputy: $712.30 Further provision for individually identified employees to receive $667.60 for the life of the Agreement in return for accepting Fixed Term Employment. 32 — Minimum rates of wages to be paid to apprentices comprises the relevant percentage of the base rate of $580.70 less $39.20, plus $39.20. Provisions of *Employment, Vocational Educational and Training Act 1988* apply except to the point of inconsistency with the terms of their contracts of employment:

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
	Level 5: $22.0795 Level 4: $19.7426 Level 3: $18.5752 Level 2: $17.4047 Level 1: $16.6251.	During first year's experience — 40 per cent During second year's experience — 55 per cent During third year's experience — 75 per cent During fourth year's experience — 90 per cent 33— Minimum rates of wages to be paid to Youth Miners: 15–16 years of age — 40 per cent of base rate 16–17 years of age — 55 per cent of base rate 17–18 years of age — 75 per cent of base rate Base rate is $580.70. Employees will also receive bonus and conditions relevant to underground employees under the Agreement.
Overtime pay	Appendix 5 — included in annualised salary.	17 — same as Award.
Shift pay	Appendix 5 — included in annualised salary.	20 — same as Award except for provision for 12 hour shifts at night which are to be paid at 120 per cent of the ordinary rate. No shift allowance is payable for a 12 hour shift worked during the day.
Weekend pay	No provision — see Award.	21 — same as Award.
Annual leave pay	27 — same as Award	Appendix 5.5 — same as Award.
Bonus pay	Appendix 6 — $1 per metre of development advance. Longwall bonus will be $2 per metre Longwall retreat up to 65 metres and $3 for every metre of Longwall retreat over 65 metres. Added together and paid weekly.	15 — consists of 2 components, 'Weekly Development metres advance' and 'Weekly Longwall retreat metres'. Longwall retreat based on metres: from 41 — 50m per week at $360 per metre to 326m and over at $170 per metre into pool for distribution to eligible employees. Eligible pool of employees does not include employees absent from work due to unpaid absence. Number of eligible employees shall vary according to the number of employees in any one week. Any differences of opinion to be dealt with through the Disputes Procedure.
Workers' compensation	No provision — see Award.	No provision.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
Sick pay	23.4.4 — paid for each shift of sick leave at the appropriate salary rate plus bonus.	Appendix 5.1 — maximum payment at employee's classification for ordinary hours to a maximum of 10 hours for 12 hour shift workers, 7.5 hours for employees working shifts in accordance with Appendix 7, or 7 hours in all other cases. Upon termination, death or retrenchment an employee who has accrued at least 70 hours or more of unused sick leave to be granted payment of unused hours.
Accident pay	Appendix 3 — rehabilitation and accident policy — same as Award except that Company continues to pay employee directly. The company in turn receives the employee's weekly entitlements from Work Cover.	34 — same as Award except that Company may give notice where an employee is certified as totally and permanently incapacitated and never likely to return to work. Liability of the Company to pay accident pay continues after termination.
Superannuation contributions	No provision — see Award.	36 — provisions of QCOS shall apply to employees for the duration of the Agreement.
Severance and retrenchment pay	50 — retrenchment pay at rate of three weeks per year of service and severance pay at rate of one week per year of service. Company has two weeks as opposed to one to find alternative employment carrying equal or greater pay to avoid retrenchment liability. One week to avoid severance liability.	30 — same as Award.
Special rates and allowances	10 — remuneration — a special Crinum allowance equivalent to $16.70 per week shall be incorporated into each employee's salary. Paid in recognition of all special disability factors (dirt and wet) at Crinum Mine which are not reflected in other payments provided for in this Agreement.	14 — Oaky Creek Underground Allowance shall be paid in lieu of all special rates and allowances to Underground employees. 12 hour/3 day weekend roster employee to receive $45 per 12 hour day worked. 10 hour/4 day roster employee to receive $37.50 per 10 hour day worked. 8 hour/5 day roster employee to receive $30 per day worked. All other ordinary/other shifts to receive $30 per day worked. Allowance includes compensation for all disabilities, conditions and special requirements such as: leading hand; tools; water money; live sewer work; dirty work; erection of scaffolding; first aid officer;

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
		First Aid Attendant; heat; height; isolation; Plumber's Licence; height (electrical/mechanical); confined spaces; shaft work; continuous production and absence of 'smokos'. 43 — Performance of Higher Duties — provision for an employee to fill positions on a temporary basis for a full shift or longer following agreement between the employer and employee.
Public holidays	20 — public holiday provisions — generally same as Award except: does not include Award provision that no work will occur on 2 public holidays nominated by the employer. 6 and 7 day roster employees shall not be required to work Christmas Day and Boxing Day. Provides option for employees required to work a public holiday to be paid at triple time, or paid at double time plus accrue a Statutory day. All Statutory holidays accrued during the year must be taken by December 31 each year. Time of taking subject to operational constraints. Holidays not taken will be paid out in the week falling around December 31. Christmas Day and Boxing Day may be carried forward to the next calendar year.	21 — same as Award.
Working clothes and safety boots	36 — 4 additional sets of working clothes compared with Award (where employee undertakes own laundry) or 7 additional sets of working clothes compared with Award (where laundered by contractor at employee's expense). One pair of safety boots supplied. Gumboots available on request. Winter coats issued every three years. Replacement generally on a wear and tear basis.	41 — same as Award except additional provision for a winter jacket which is to be replaced every 3 years. Footwear and clothing to be replaced under extenuating circumstances where damage occurs during the course of employment through no fault of the employee. Other protective equipment to be supplied on an as needs basis. Repetitive failure to wear appropriate safety and protective equipment will lead to an employee's continued employment being jeopardised. 42 — provision for replacement of an employee's tools and clothing damaged in the performance of normal duties.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
Travel	34 — transport provided to and from Emerald for normal rostered work and if required for overtime.	
Training costs	No provision — see Award.	No provision.
Other on-costs	35 — Accommodation Assistance — Appendix 11 — Crinum Home Ownership Scheme — consists of either a house, land and loan package or a loan only package. 37 — Company to supply necessary tools. 38 — Health Benefit — Health Fund arrangements as agreed at BHP Coal State Consultative Committee. 39 — Death and Disability — Company Scheme pays $100 000 upon death or disablement of an employee. 40 — Leasing Program — agreement to introduce.	
Functions, tasks and skills		
Functions	49 — Employee Representatives — recognition same as Award. Representatives permitted to discuss issues with Mine Management and employees during working hours subject to agreement and appropriate paperwork.	8(e) — provision that seniority will play no role in the allocation of duties, shifts, job movements or promotions. 39(a) — Union representation. Company to recognise Union representatives as elected representatives of union members at the workplace subject to a number of conditions. These include: the performance of each union representative's obligations under the Agreement as their primary responsibility, no more or less favourable treatment to union representatives than other employees, ensuring strict compliance with the Disputes Procedure and the right of the Company to review, alter, amend or withdraw their support to the union and their representatives in conducting their affairs at Oaky Creek in the event of unlawful industrial action being embarked upon. 39(b) — Provision to allow union representatives the necessary time during working hours to interview the Company or its representatives on matters affecting the employees represented by

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
		the union. This is subject to union representatives only leaving their job with the authorisation of their immediate supervisor. Absences from the job being restricted to the necessary period as identified by the employee and as agreed between the Supervisor and the Union representative. Such absence permitted only where the first stage of the Disputes Procedure has not been complied with and all efforts made to resolve the issue at the lowest possible level. Union representative to provide a written account of the result of discussion to which they absented themselves. 39(c) — Provision for leave of absence for union representatives to attend bona fide union business. Consideration to be given to productive requirements of the operation or the Company's interests. Approved leave at the discretion of the Company. If absence is not approved by the supervisor, leave is to be regarded as unauthorised absence. 39(d) — Maximum of 10 days' paid leave of absence per year available for Union training. 10 days to be split by agreement between the respective unions and their representatives. 39(e) — Provision for maximum of 2 hours' paid attendance at monthly Union meetings. Meetings to be conducted off site on Sundays and issues raised and outcomes to be provided to Employee Services Manager by Union representative. 39(f) — No paid time off available to Union representatives for interviewing/attempting to recruit employees of outside contractors. 39(g) — Provision for Union representatives to address new company employees during induction provided that Company officials are present and no coercion applied. 39(h) — Provision for paid leave in circumstances other than those outlined above by agreement and restricted to exceptional circumstances.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
		39(i) — Payment for employees or their representatives where paid leave approved by the Company is limited to employees' loss of rostered earnings. Otherwise unrostered time spent on bona fide union business will not be payable. Exception is where Agreement provides otherwise.
Job and task demarcation	41 — Demarcation — agreement that subject to safety and operation of the Crinum Work Model demarcations giving rise to inefficiencies will not have a place at Crinum Mine. Appendix 8 — Work Model — two streams of mineworker, production and engineering. Five levels with progression based on acquisition of additional skills. Level 5 is by appointment. New entrants paid at level 1.	8(a) — provision that an employee's classification or union membership/non-membership will not limit the scope/range of work or training they are required to perform, and that no skills possessed by an employee will be quarantined from use on the job. Work to be organised to maximise the flexibility of the workforce. Principal consideration in the allocation of work will be that an individual is competent to perform a given task safely. 8(b) — provision for production employees to be trained in, and perform when competent, routine maintenance on equipment. 8(c) — provision for tradespersons to be trained in, and perform when competent, production tasks to enhance teamwork and facilitate efficiency of operation with the exception of continuous miners. 8(d) — provision for deputies to participate in production duties as part of the team and exercise overall leadership qualities. 8(e) — provision that seniority will play no role in the allocation of duties, shifts, job movements or promotions. 8(f) — provision for staff/management to perform production or engineering tasks within their competence and ancillary to their staff/management duties or where providing a hand. Training to undertake such tasks is agreed.
Training	No provision — see Award.	40 — training to be consistent with the ongoing skills and competencies required by the operation. Fair opportunity and treatment of employees to be provided.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
		Provision for co-operative approach to training through the documentation of processes, procedures and other relevant materials for reference purposes.
Qualifications	No provision — see Award.	No provision.
Procedural arrangements		
Relationship with Award	Agreement replaces in part, provisions of the P&E Award. It includes terms and conditions of employment for those employees covered by the Award. Where this agreement differs from an Award provision then this Agreement prevails.	Agreement contains all conditions of employment and entitlements of employees employed under its terms and conditions by Oaky Creek Coal Pty Ltd to the exclusion of all other Awards, Agreements and industrial instruments.
General	43 — Environment — provision of adequate resources to familiarise employees with BHP Coal Environment Policy, relevant legislation, site requirements and the necessary aspects of the Plan of Operations.	23 — absenteeism procedure — absenteeism records to be reviewed every 2 months. Unsatisfactory attendance triggered by the total number of days absent (trigger points being 8 days in 12 months or 5 days in 6 months), patterns of absenteeism, recent and long-term attendance and any other factors affecting the employee's ability to attend for work. Where attendance is unsatisfactory, and an employee is absent from work without a good and sufficient reason, the following 4 step process shall occur: the employee shall be verbally consulted by their supervisor on the first occasion; on the second occasion the employee is to be verbally counselled by Management in the presence of a union delegate and a written warning issued highlighting the seriousness with which a third offence shall be viewed by management; on the third occasion the employee to be verbally counselled by Management in the presence of a union delegate and a written warning issued to the employee, with a copy sent to the union, that a fourth offence shall warrant dismissal; and on the fourth occasion the employee is subject to dismissal. Written warnings lapse 12 months after their issue if no subsequent offence is committed during that period or within the 6 months following their removal. An employee who

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
		is absent for 3 or more consecutive days and who does not notify the Company of such absence and reasons for such absence shall be dismissed. Provision for redress to Disputes Settlement Procedure if employee considers absence was with good and sufficient reason. 38 — communication — general manager of the mine site to address the workforce at least every 3 months during working hours to provide information which affects their employment. Information includes mines budget and targets, performance against budget, safety performance and policies, major changes in organisation structure, technology, production or policy that may significantly affect employees. Significant change which adversely affects employment, and measures to avert or mitigate such effects, to be debated by the Oaky Creek Coal No. 1 Underground Mine Consultative Committee.
Dispute settlement	45 — Disputes Procedure — same as Award. The 4 stage dispute process excludes discussion between District officials of the CFMEU and Senior company officials as contained in Award. Parties agree to avoid use of legal argument before AIRC unless necessary to resolution of issue. Work to proceed under conditions prevailing before the dispute. Where these conditions disputed, work to continue at reasonable direction of employer; the employee's recognised skills, competence and training; and safe work practices. 47 — Fair Treatment — provides 4 step Fair Treatment Plan which is proceeded through in differing time frames depending on seriousness of matter. Remain on Plan until recover desired behaviour. 48 — Anti-discrimination /Harassment P rocedure — employee may pursue complaint through Fair Treatment Plan or provisions of BHP Policy on Harassment and Discrimination at Appendix 14.	22 — same procedure as Award except that if conciliation fails to resolve the issue, issues concerning the interpretation are to proceed to the Federal Court; issues of non-compliance are to proceed in accordance with the compliance sections of the WR Act, and if the matter is within the items listed in s.89A of the WR Act the Commissioner who conciliated shall arbitrate the matter with the parties retaining their rights of appeal. Work to proceed while the procedure is being followed in accordance with the reasonable direction of the Company, the employee's skills, competence, training and safe working practices.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
Agreement making	53 — Duration of Agreement — parties agree to review operation of Agreement and if agreed, to extend the Agreement for a further year without any additional claims than those detailed within Agreement.	
Negotiating change	No provision — see Award.	6 — provision to establish Oaky Creek Coal No 1 Underground Mine Consultative Committee to oversee operation of the Agreement. Comprises 3 management representatives, 2 CFMEU and 1 CEPU representatives. To meet once every 2 months and the minutes to be issued to all committee members and posted on all noticeboards. 9 — all previous custom and practice, whether documented or not, will cease from the operative date of the Agreement. No further customs or practices shall be recognised or bind the parties unless agreed in writing and incorporated into the Agreement.
Redundancy	No provision — see Award.	31 — same provisions as Award with a number of exceptions. The practice of last on, first off does not apply. Moreover, Company to notify relevant unions at the option of the employees concerned.
Payment of wages	9 — salaries paid directly into a maximum of five accounts by no later than Friday of each week. Mineworkers failing to submit signed time sheets prior to 9am on Monday of each week will not be paid for that day until a signed and authorised time sheet is forwarded for inclusion in the next pay run.	16 — same as Award except provision for deduction of union dues and upon termination wages due to an employee to be deposited into their account on the day termination takes effect.
Safety management	3 — OH&S —Appendix 2 — Alcohol Testing Policy — no one permitted to remain in the workplace while under the influence of alcohol (blood alcohol content of 0.05 gm/100ml or greater). Non-compliance may result in disciplinary action. Commitment to ongoing education program. Recognises dependence as a treatable condition. Details methods of testing for alcohol. Promotes voluntary testing. Details mandatory testing procedure, including	24 — provision for Oaky Creek Coal No 1 Underground Mine OH&S Committee to be established. State legislation and regulations to be complied with. Chaired by Mines officer. Ability to make recommendations to management concerning the Rehabilitation Policy. 25 — provision to review current Rehabilitation Policy to ensure needs of Organisation and legislative requirements are met.

Type of arrangement	*Crinum*[a]	*Oaky Creek*[b]
	after an accident resulting in death or serious injury, damage to equipment or property, or near misses with potential serious injury or equipment damage. All tests and results shall remain confidential. Performance Improvement Procedure — First offence detailed on file. Second offence within six months of the first results in details recorded on file and professional counselling. Third offence within 12 months of the first. Process involves rehabilitation. Leave available for voluntary rehabilitation and reimbursement of costs. Provision for suspension without pay after fourth offence within 2 year period. 5 positive readings within 3 years of the first offence results in dismissal. 44 — Flood Procedure — involves safe transportation of Crinum employees during flood periods which involve a threat of road closure. 46 — Safety Resolution Procedure — similar to Dispute Procedure. 4 stages, final stage being discussion between District Mines Officer, Department of Minerals and Energy Inspector of Coal Mine and the nominated senior Company officials. Appendix 3 Workplace Rehabilitation Policy — details rights and responsibilities of injured/ill employees, their families, fellow employees and various coordinators. Includes injury plan of action and individual case management as well as arrangements for selected/alternate duties.	26 — Drugs and Alcohol — provision for routine and targeted alcohol testing where it is believed an employee's performance is impaired by alcohol. Drug testing protocol to be established during the term of the Agreement. Appendix 4 makes provision for drug and alcohol education and sets a maximum blood alcohol content of 0.05 per cent. All tests to be witnessed. Any person over 0.05 per cent will be retested prior to the commencement of the next shift. A blood test to be taken in the event of a disagreement over the results of a breath test. Wages for the day are to be paid and medical expenses reimbursed in the event the breath test was incorrect. Refusal to take the test will constitute a failure of the test. An employee who refuses to accept transport home after failing a test and instead drives himself offsite shall be reported to the local police. Provision for rehabilitation of employees who fail a test. Appendix 3 — OH&S issue resolution protocol. 5 step procedure. If unable to resolve issue satisfactorily proceed from individual employee to supervisor, to Superintendent and Miners officer, to Line Manager and Statutory Manager, to General Manager or Department of Mines and Energy or to District Check Inspector.

a Binding on BHP Coal Pty Ltd, the CFMEU and members of the CFMEU employed at Crinum. Two year Agreement expiring on 17 October 1999.

b Binding on Oaky Creek Coal Pty. Ltd., the CEPU and the CFMEU. Agreement to operate for one year from the date of certification by the AIRC.

H METALLIFEROUS AWARDS AND AGREEMENTS

This appendix provides an overview of a small number of metalliferous awards and collective agreements in the two main metalliferous mining States of Queensland and Western Australia. No State or Federal individual agreements are summarised in this appendix.

The awards and agreements presented in Tables H.1 to H.3 are as follows:

- *Queensland Mining (Non-coal) Award — State*;
- Cannington — Broken Hill Proprietary Ltd mine. Agreement made under the jurisdiction of the Queensland Industrial Relations Commission;
- Gunpowder — Gunpowder Copper Ltd mine. Agreement made under the jurisdiction of the Australian Industrial Relations Commission;
- Mt Isa — Mt Isa Mines Ltd mine. Agreement made under the jurisdiction of the Queensland Industrial Relations Commission; and
- BHP Iron Ore Ltd Western Australia mines — Mt Newman Joint Venture and Mount Goldsworthy Mining Associates Joint Venture. Agreement made under the jurisdiction of the Western Australian Industrial Relations Commission.

Industrial relations in Queensland and Western Australia

The *Workplace Relations and Other Legislation Amendment Act 1996* (Qld) regulates industrial relations in Queensland. It largely reflects the (Federal) WR Act but differs slightly in that it confines awards to 19 allowable matters. The Queensland Industrial Relations Commission (QIRC) may determine the number of hours which part-time (minimum continuous hours of employment per day) and casual employees (minimum number of hours for single continuous engagement) may work. Under the Queensland Act new awards will be restricted to core matters that collectively provide a safety net of fair minimum wages and conditions. Existing awards will be simplified so that they cover only these 19 core matters.

The general conditions contained in part 12 of the former *Industrial Relations Act 1990* (Qld) applying to award employees continue for 18 months. Existing provisions allowing the QIRC to make orders for minimum wages in non-award areas will also be retained. This provides an opportunity for these provisions to be incorporated into awards where this has not already occurred. These include

limiting the hours of work to six days in any period of seven consecutive days, 40 hours in any period of six consecutive days and eight hours in any day, overtime rates at time and a half and double time for more than one shift per day, one week sick leave for each completed year of service, 13 weeks' long service leave for 15 years of continuous service, and 52 weeks' unpaid parental leave.

In contrast to the Federal and Queensland industrial relations systems, the *Minimum Conditions of Employment Act 1993* (WA) sets out statutory minimum conditions applying to all employees in Western Australia. The Act is designed to provide a base for the parties to negotiate from and applies to all employers and employees, whether they are covered by a workplace agreement, award or common law contract. The Act provides a minimum rate of pay, 4 weeks' annual leave per year, 10 days paid sick leave per year, 2 days' bereavement leave per year, 10 public holidays per year and 52 weeks' unpaid parental leave. The minimum wage is reviewed annually by the Western Australian Industrial Relations Commission and a recommendation is made to the Minister.

Table H.1: **Overview of formal work arrangements in *Queensland Mining (Non-coal) Award — State*** [a,b]

Type of arrangement	*Clause*	*Award provision*
Size of the workforce		
Recruitment	*2.7*	Preference of employment given to financial members of Australian Workers' Union (AWU), Queensland.
	2.16	Initial probationary period of employment of 12 weeks (for induction, initial company training and assessment of employee's performance). Employees to be advised of unsatisfactory performance. Period of probation to count for accrual of leave entitlements but no entitlement to paid leave during this period (except sick and bereavement leave).
	2.1.1	All employees, except casuals, are employed by the week.
Retrenchment	*2.7*	Preference of employment in retrenchment given to financial members of AWU (Qld).
	2.1.2	Employees' notice of termination is the same as for employer (but no additional notice based on employee's age). Notice of termination by employer specified (based on years of continuous service with the employer)— ranges from 1 week's notice for one year of continuous service or less to at least 4 weeks' notice for employees with more than 5 years of continuous employment.
	2.1.3	In addition, employees over 45 years of age at the time of the giving of notice with 2 or more years of continuous service are entitled to an additional week's notice.
	2.1.6	During probationary employment period, either party may terminate employment by giving one day's notice.
	2.1.4	In lieu of notice, compensation must be paid as if the employee had continued employment for the relevant period.
Dismissal	*2.1.5*	Employer can instantly dismiss an employee for misconduct or other grounds that justify summary dismissal.
Retirement		No provision.
Use of casuals, contract employment and contractors	*2.1.7*	Fixed-term employees are engaged for a fixed term and are able to accrue pro rata leave entitlements. Details of the fixed term shall be in writing and may only be varied, in writing, by consent of the parties. If change to employment on a weekly basis during contract period, accrued service entitlements shall form part of the employee's period of continuous service.
	2.1.9	Casual employment allowed.
	6.9	Contract and/or piecework is allowed in all classes of work provided that the contract or piecework is not a condition of employment and that the piecework rate ensures a certain weekly minimum pay level is reached.
Manning levels		No provision.

Type of arrangement	*Clause*	*Award provision*
Hours of work and roster arrangements		
Ordinary hours	*4.1.1*[c]	Ordinary hours of work not to exceed an average of 38 hours per week.
	4.1.2[c]	Unless agreed otherwise, ordinary hours for day workers shall be worked continuously between 6am and 6pm.
	2.1.9	Casual employees shall be employed for a minimum of 4 hours on each engagement and shall work no more than 8 hours per day or 38 hours per week without payment of overtime (unless otherwise agreed when engaged in conjunction with a cyclic roster).
	4.3	Employees entitled to an unpaid half to 1 hour meal break (as agreed between the employer and the employees) to be taken between the fourth and sixth hours from the ordinary starting time.
Part-time hours	*2.1.9*	Part-time employees are engaged by the week to work up to an average of 32 regular hours per week. Ordinary daily hours are to be worked continuously excluding meal breaks.
Overtime hours		No direct restriction, except those implied by clause 4.2.6 for shift workers.
Shift arrangements	*2.2.1*	Employees may be required to transfer from day worker to shift worker (and vice versa), provided that at least 48 hours of notice is given by the employer of such change and has had 10 hours off duty between shifts (clause 4.1.4).
	4.1.4[c]	For shift workers, ordinary hours shall not exceed 10 hours in any shift, 152 hours in any four week roster and 304 hours in any eight week roster. Shift workers shall work at times required by the employer, provided that a shift shall not extend beyond 10 hours, inclusive of a paid meal break of at least 30 minutes. An employee is not required to work more than one shift per day with the exception of changeovers. By agreement between the employer and the majority of employees, 12 hour days may be worked provided that: (1) the employer and employees are guided by the ACTU Code of Conduct on 12 hour shifts; (2) proper health monitoring procedures are introduced; (3) suitable rostering arrangements are made; and (4) proper supervision is provided. (See also clause 4.2.6 under paid breaks.)
Roster arrangements	*4.1.4*[c]	For shift workers, work is to be carried out over consecutive recurring cycles, with each cycle consisting of a specific number of consecutive working days followed by a specific number of consecutive non-working days. Shift work rosters shall be agreed between the employer and majority of shift workers. Agreement shall include the pattern of working and non-working days, commencing and finishing times of ordinary hours for respective shifts, and shall be posted to provide at least 7 days' notice of any change. Seven days' notice shall be given to an employee required to transfer to another shift roster.

Type of arrangement	*Clause*	*Award provision*
Paid breaks	*4.1.4*[c]	Shift workers shall work at times required by the employer provided that a shift shall not extend beyond 10 hours, inclusive of a paid meal break of at least 30 minutes.
	4.2.3	A paid meal break of 30 minutes is given for overtime continuing for more than 2 hours beyond the ordinary (or agreed roster) ceasing time.
	4.2.6	An employee without at least a 10 hour break between the termination of ordinary work one day and the commencement of ordinary work the next day (due to working overtime) to receive a 10 hour break after the completion of overtime without loss of pay for ordinary time not worked during such break. An employee who has not received a 10 hour break in the 24 hours immediately prior to ordinary commencement time on a Monday shall be released after completing such overtime without loss of pay for ordinary time worked during such break. An employee instructed to resume or continue work without receiving a 10 hour break to be paid at double time until he receives a 10 hour break. The employee shall not lose pay for ordinary working time during such a break. (This subclause applies to shift workers who rotate from one shift to another as if 8 hours were substituted for 10 when overtime is worked: (a) for the purpose of changing shift roster; or (b) where a shift worker does not report for duty; or (c) where a shift is worked by arrangement between the employees themselves.)
	4.3	All work done during the recognised meal break (normally unpaid) will be paid at double time rates and will continue until such break is taken.
	4.4	Rest Pauses: a paid 10 minute break in the first and second half of daily work to be taken so as not to interfere with necessary continuity of work. Where the majority of employees agree, these may be combined into a single 20 minute break.
Annual leave	*5.1.1*	For all employees (except casuals) for each completed year of employment, annual leave to accrue as follows: (a) a minimum of 5 weeks for continuous shift work, worked over 7 days per week; (b) not less than 4 weeks in any other case; (c) pro rata where an employee is engaged for work carrying an entitlement of 4 or 5 weeks' leave in a 12 month period. Periods of three months or less of periods of unpaid leave of absence to be included in the calculations.
	5.1.2	Annual leave excludes statutory holidays during the period of leave.
	5.1.6	Reasonable notice of the commencement of annual leave shall be given to the employer.
Long service leave	*5.6*	All employees entitled to long service leave on full pay as per Part 12, Division 2 of the *Industrial Relations Act 1990* (Qld).

Type of arrangement	*Clause*	*Award provision*
Sick leave	*5.3.1*	For each completed year of service, all employees (except casuals) entitled to 60.8 hours of sick leave. For those with less than one year of service, sick leave entitlement to accrue at the rate of 7.6 hours of sick leave for each 6 weeks of employment.
	5.3.3	Where absence from work is more than 2 days, employee must produce medical certificate specifying period he/she is unable to work and promptly notify the employer in order to receive full payment for the absence.
	5.3.4	In cases where (1) the absence is approved by the employer or (2) the employee is dismissed, stood down or terminated for a period of less than 3 months, then where the employee is subsequently re-employed by the employer, continuity of service record for the purposes of accruing sick leave is unbroken.
Parental leave	*5.5*	Provisions of the *Family Leave Award* (Qld) to apply. This Award is to be displayed in accordance with the relevant Act. Provisions concerning Special Responsibility Leave can be altered by agreement provided that departure does not reduce the employee's entitlements. Part-time work can be performed by agreement in circumstances specified in the *Family Leave Award*.
Other leave	*5.2.1*	Eleven public holidays recognised on specified dates.
	5.2.2	Where a public holiday falls on a day that a continuous shift worker or seven day worker is rostered off they shall receive an additional day of leave. This may be taken in conjunction with annual leave or paid as 7.6 hours if the additional time off disrupts the roster.
	5.2.3	Where the majority of employees and the employer agree, statutory holidays may be substituted for other ordinary working days, provided that work performed on the substituted holiday shall be paid at the applicable holiday rate.
	5.4	Bereavement Leave — weekly employee upon the death of specified list of family members is entitled to 2 days of leave up to and including the day of the funeral without deduction of pay. Notice shall be given and proof furnished to the employer.
Remuneration and on-costs		
Base pay	*3.3*	Pay rates are minimum weekly rates for mine employees grades 1 to 9, inclusive of the base rate and supplementary payment.
	2.1.9	Casual employees to receive an hourly rate equal to one thirty eighth of the appropriate weekly rate plus 19 per cent loading.
	2.4	Employer has right to deduct pay for any day an employee cannot be usefully employed for causes which the employer cannot reasonably control.

Type of arrangement	*Clause*	*Award provision*
	6.5	Where an employee is required to work in an area covered by the Award but in another workplace, the employee shall be paid at the scheduled rate of wages fixed by this Award (including travel time to this place of work) but not exceeding 8 hours' wages in any one day and provided that the employee remains in the service of the employer for at least 1 month.
	6.9	Minimum piecework rate to ensure that the average competent employee can earn at least 30 per cent above the Award rate.
Overtime pay	*4.2.1*	Day workers — all time worked in excess of ordinary working hours (38 per week) shall be paid at the rate of time and a half for the first 3 hours and double time thereafter.
	4.2.2	Employees working cyclic work patterns either on day or shift work shall be paid overtime at double time.
Shift pay	*4.1.4*[c]	Shift workers employed on afternoon or night shift, Monday to Friday, shall be paid an allowance of 15 per cent of the hourly rate for a mine employee grade 2 for each hour worked.
Weekend pay	*4.1.3*[c]	Ordinary hours worked by day workers or shift workers to be paid at time and a half on Saturdays and double time on Sundays.
Annual leave pay	*5.1.2*	Statutory holidays while on annual leave to be paid in advance at the rate payable immediately prior to that holiday under the Award (whether in excess of or at the ordinary rate).
	5.1.5	Annual leave pay (including proportional payments) to be calculated as follows: (a) shift workers — wage rate is the rate payable on the employee's roster or projected roster, including Saturday and Sunday shifts; (b) day workers — ordinary award wage rate for the annual leave period plus 17.5 per cent annual leave loading.
	5.1.7	Payment in lieu of annual leave is unlawful.
	5.1.8	Annual leave entitlements are credited on the basis of a 38 hour week and applicable rates of pay are calculated on a 38 hour division. Prior credits to be converted according to a specified formula.
Bonus pay		No provision.
Workers' compensation		No provision.
Sick pay	*5.3.2*	Accumulated sick leave to be credited on the basis of a 38 hour week and payment worked out on a 38 hour divisor. Credits converted according to a specified formula.

Type of arrangement	*Clause*	*Award provision*
Accident pay	*6.4*	Employees who leave work before the completion of a shift because of accident (or cease work to attend to an injured person) to be paid the full shift. Employees must report to and seek leave from the shift boss or foreman to cease work and must return to work immediately after the errand or purpose for which the employee obtained leave is completed.
Superannuation contributions	*3.6*	Employers and employees to observe the terms and conditions of the declaration of 'Policy on Occupational Superannuation' and any subsequent decisions of the QIRC.
Severance and retrenchment pay	*2.1.7*	Fixed-term employees on contract for less than 12 months not eligible for termination, change and redundancy payments at end of fixed-term engagement.
	2.3	Employees and employers to observe the terms and conditions of the 'Statement of Policy of Termination of Employment, Introduction of Changes, Redundancy' contained in the decision of the Full Bench of the QIRC.
	5.1.3	An employee terminated at the expiration of a full year of employment shall be paid 4 or 5 weeks' annual leave and ordinary pay for any statutory holiday which occurs during that period.
	5.1.4.	For employees terminated prior to a full year of employment, annual leave will be paid out at the rate of one-ninth of ordinary pay if employed on continuous shift work over 7 days and one-twelfth of ordinary pay for other work, calculated in accordance with sub-clause 5.1.5.
Special rates and allowances	*3.7*	Allowances include: (1) divisional and district; (2) single all purpose disability (covering wet or hot work, wet ground, working in water or rain, winze and shaft sinking and rising, height, cleaning flues and isolation) (not applied if site disability allowance paid); (3) site disability (QIRC can vary the Award if satisfied there are special and compelling circumstances not contemplated in original award provision); (4) single all purpose exploration and surface prospecting (paid for disabilities associated with working in the open and thereby being subject to adverse conditions — isolated under-developed locations, exposure to heat, cold, wind, dust, mud, dirty conditions, lack of amenities) (all purpose disability allowance not to apply if exploration and surface prospecting allowances are paid); (5) underground (paid only to mine employees grade 1 to 4 who are working underground); (6) tool (paid where employees required to use their own tools, not payable during annual leave); and (7) first aid (paid to recognised 'First Aid Person' who holds appropriate certificate).
	4.2.4	Meals or meal allowance: where overtime extends for more than 2 hours beyond the ordinary or agreed roster ceasing time, a meal is to be supplied at the employer's expense or a meal allowance paid.

Type of arrangement	*Clause*	*Award provision*
	4.2.5	Call back or Recall to Duty: employees recalled to work after completing their normal or prescribed hours, or after completing their rostered shift, and having left the site or on their rostered day off shall receive a minimum 2 hours' pay at the appropriate overtime rate. If the job is completed within a shorter time, the employee shall not be required to work the full 2 hours except in unforseen circumstances. (This subclause shall not apply where it is customary for an employee to return to the job site out of hours to perform a specific task where standard overtime rates would apply.) Actual work which is less than 2 hours shall not count as overtime for the purpose of clause 4.2.6.
Public holidays	*5.2.4* *5.2.5*	Work performed on a public holiday shall be paid at the rate of double time and a half with a minimum of four hours. Time worked on holidays outside the working hours specified in the award, prescribed by the roster, or usually worked on the day of the week on which the holiday usually falls shall be paid at double the rate specified in clause 5.2.4 (that is 5 times the Award rate).
Working clothes and safety boots	*6.8*	Each employee to be provided, on commencement, with three sets of work clothes and one pair of suitable safety footwear free of charge. Where any employee terminates or is terminated within 6 months of receiving clothing and footwear then the employee shall pay the appropriate proportionate amount of the value of the clothing and/or footwear (but excludes employees terminated due to ill health or age). The employer will replace any item of footwear or clothing on a fair wear and tear basis.
Travel	*6.11*	Travelling Time — Prospecting: where an employee travels away from usual place of employment and/or residence for reasons of prospecting, the employee shall be conveyed to and from the camp (or pick up place) free of charge and shall be paid at ordinary rates for the travelling time up to a maximum of 8 hours. Where the prospecting work is performed at a place away from the camp or pick-up place, the employees shall be paid travelling time one way at ordinary rates. Where an employee is dismissed, the employee shall be provided, at dismissal, with transport to the nearest place at which public transport is available to the employee's place of residence, whichever is the nearer.
Training costs		No provision.
Functions, tasks and skills		
Functions	*2.2.2*	An employee may be directed to carry out such duties and use such tools and machinery as within the employee's skill level, competence and training, provided such duties are not designed to promote deskilling. Such directions will be consistent with a safe and healthy working environment.

Type of arrangement	*Clause*	*Award provision*
Job and task demarcation	*3.2*	Classification structure for mine employee from grade 1 to grade 9 — broad job descriptions and competencies (including some detail on qualifications for use of specified plant and equipment functions) for each of the 9 levels are described. Employees at the grade 6 level hold trade qualifications or have progressed by experience and training to an equivalent level of skill. Pay relativities are expressed in relation to mine employees grade 6.
Training	*3.2.1.*	Standard induction training to cover: conditions of employment; mine and plant safety; first aid procedures; movement around the site; work and documentation procedures; quality control and quality assurance; and introduction to supervisors and fellow workers.
Qualifications	*3.2*	Employer also to recognise any prior learning applicable to the skills and competencies required for each employee. Employees must have demonstrated competency on specified pieces of equipment and for trades occupations hold the relevant trade qualifications, as well as post-trade courses for the higher skill occupational classifications.
Procedural arrangements		
General	*6.1*	Mining camp standards: where employees are required to live in a permanent camp, the Award sets out minimum standards for accommodation and messing facilities and arrangements to be provided. Employees engaged on surface prospecting and exploration are excluded from this clause.
	6.2	Provision of cook paid for by employer where 7 or more employees engaged on surface prospecting and exploration work. An employee detailed to do cooking shall be paid at no less than the cook's rate. Accommodation and messing facilities will be provided and be of reasonable standard. Disputes to be addressed through clause 2.6.
	6.3	Crib Places: A 'plat' to be set aside for crib time (where it is the practice of employees to take their crib underground). Employees required to remain on dredges to be provided with shelter enabling them to eat their crib without getting wet. Minimum facilities to be provided by employer set out in Award.
	6.7	A good and sufficient supply of drinking water to be kept at each level in all mines and at convenient places in all smelting works and surface workings.
	6.12	Tributers: arrangements for payment of royalties etc.
	6.13	Employer to supply a wet bulb thermometer, placed at the convenience of employees to test temperature. Work in regard to hot places to be in accordance with s.221(9) of the *Industrial Relations Act 1990* (Qld).
Dispute settlement	*2.6*	Explicit recognition that individual problems arise from time to time and matters should be resolved promptly. Agreed by employee, employees and AWU that grievances be resolved without loss of pay and loss of production. Employer committed to grievance resolution through open communication and without any stoppage of work or any ban,

Type of arrangement	*Clause*	*Award provision*
		limitation or restriction on the performance of work. Specified grievance process in 3 steps: (1) aggrieved individual to raise matter with supervisor who attempts fair and prompt resolution; (2) if matter not resolved, refer to appropriate department manager; and (3) if need be the matter shall be referred to the manager of operations who shall resolve the matter as soon as practically possible. An employee may nominate a representative to be present during the process at any stage. Where matter unresolved either party may exercise its rights under the *Industrial Relations Act 1990* (Qld). During the three-step grievance process, normal work and production activities to continue and no stoppages of work or any form of limitation of work shall occur.
Agreement making	*1.6*	At each enterprise or workplace, consultative mechanisms and procedures to be established comprising representatives of the employer and employees. Union entitled to be represented. Consultative mechanisms and procedures to be appropriate to the size, structure and needs of the enterprise or workplace. Application to vary the Award conditions by agreement to be made to the QIRC and to become a schedule of the Award (where this clause is used to vary the Award). Pre-requisites for QIRC to vary the Award include: that the purpose is to make the workplace operate more efficiently according to its particular needs; that the majority of employees covered by the Award genuinely agree to it; and the award variation meets the requirements of the no disadvantage test set out in the *Industrial Relations Act 1990*, (Qld).
Negotiating change		See clauses 1.6 and 2.3.
Redundancy	*2.3*	Except as provided for in clause 2.1.2, employers and employees must observe the terms and conditions of the 'Statement of Policy of Termination of Employment, Introduction of Changes, Redundancy' contained in a decision of the Qld Full Bench. Provision of clause A (termination of employment) in that decision does not apply in this Award except in circumstances resulting from technological changes and/or redundancy as set out in clauses B and C of that decision. Employers to display a copy of the full bench decision so as to be easily read by employees.
Payment of wages	*3.5.1*	Wages to be paid at least fortnightly by Electronic Fund Transfer directly into employee's account in any financial institution.
	3.5.2	Where an employee is paid on a day other than a regular pay day, the employee is to be paid by cheque. No more than 3 days' pay are to be held as back time.
	3.5.3	Upon discharge or resignation, wages and holiday pay shall be paid within two working days of ceasing employment. Where employee has given the prescribed notice period, all wages and holiday pay shall be paid at or before time of termination.

Type of arrangement	*Clause*	*Award provision*
	3.5.4	Each employee shall be supplied a statement in accordance with the *Industrial Relations Act 1990* (Qld).
	6.10	Union Tickets: Employer (on written request of any employee) to deduct union dues from wages and forward contributions to the AWU.
Safety management	*6.6*	First Aid — employer to provide an ambulance stretcher at every mine together with an adequate supply of first aid equipment and requisites. Duty of mine manager or smelting works to convey seriously injured to nearest hospital as soon as possible. For mines with ten or more people (or when required by the Inspector of Mines), manager to ensure that at least one person is qualified and the holder of a first aid certificate.
	6.14	Statement that the parties to the Award are committed to achieving healthier and safer jobs through workplace changes aimed at improving efficiency and productivity. This is to be accomplished by a comprehensive approach to managing occupational health and safety which aims to: control hazards at source; reduce the incidence and costs of occupational injury and illness; and where practical provide a rehabilitation system for workers affected by occupational injury or illness.

a Award coverage: all employees engaged in metal and/or mineral exploration and development work and/or to all employees engaged in the mining and/or smelting and/or reducing and/or refining of ores including phosphates and gemstones throughout the State of Queensland and to the employers of such employees. Exceptions to this coverage include those workplaces with workers performing the above duties which have Industrial Agreements with the AWU as well as the following specific awards: *Mount Isa Mines Limited Award; Queensland Nickel Employees' Award — State; Mineral Sands Industry Award — State;* and *Quarry, Crushed Stone, Sand and Gravel Industry Award — State.*

b Occupational coverage: ranges across basic semi-skilled work, semi-skilled plant and machine operator, to skilled trades levels.

c The following mines are excluded from the hours of work provisions set out in clause 4.1: Mt Leyshon Gold Mine; Pajingo Gold Mine; Ravenswood Gold Mine; and Selwyn Gold Mine.

Source: *Mining (Non-coal) Award — State*, Queensland.

Table H.2: **Overview of formal work arrangements in recent metalliferous mining agreements: Cannington, Gunpowder and Mt Isa**

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
Size of the work force			
Recruitment	No provision — see Award.	12(e) — Company is an equal opportunity employer in all sections including underground. Award Clause 20 — positions at Mineworker levels 1–4 offered to financial members of AWU or those undertaking in writing to join upon employment.	3.5 — Multi-area employees normally employed on the surface in the Mining Area may be required to work underground at the election of the Company. 3.5(e) — employees regularly required to undertake higher duties will be nominated by the company. Numbers of competent persons to fill in on the Production Contract to be determined by the Company. Replacements on a vacancy basis only. Production Contract conditions will apply.
Retrenchment	No provision — see Award.	No provision.	4.4(b) — notice periods for termination of employment depends on length of service and age of employee.
Dismissal	No provision — see Award.	No provision.	4.4(b) — notice period for termination does not apply in the case of dismissal for misconduct or other grounds that justify summary dismissal.
Use of casuals, contract employment and contractors	No provision — see Award.	5.6 — casual employees — engaged to work no less than two hours on any one day to a maximum of 30.4 hours in any one week unless otherwise agreed. See also Award Clause 8.5 — contract parties allowed and formed for particular	

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		duties. Can be paid according to directly measurable performances, replacing the Gunpowder production bonus for those particular duties. See Award 8.9 – 8.15 — provisions detailing: establishment of contract terms and conditions, conditions of appointment for permanent and temporary members; notice of termination of contract; employees performing work (at bonus rates); contract workers working outside normal duties (at appropriate pay rates); and pay and work arrangements where contract party members unable to perform normal duties (if no work available, contract workers to be paid appropriate hourly wage rate without bonus or contract payment for relevant period).	
Manning levels	No provision.	No provision.	No provision.
Hours of work and roster arrangements			
Contract of employment	No provision — see Award.	No provision in Agreement, see Award — Clause 13.6 & 13.7 — entitlements accrue during paid absence. Unpaid leave in excess of one week or unauthorised leave accrual continuity. Award Clause 20 — Award forms part of contract of employment for employees engaged as Mineworker Level 1 to 4. Employees not specifically engaged as casuals deemed to be employed by the week. Unnotified absence exceeding 5 days shall be	No provision.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		taken as abandonment of employment. Three months probationary period. Company employment benefit schemes do not apply to unsatisfactory probationary employees. Employees to observe rules and regulations laid down by employer pertaining to affairs of the Gunpowder community. Failure to observe results in disciplinary proceedings.	
Ordinary hours	No provision — see Award.	See Award — Clause 5 — 38 hours in a one week period. Ordinary days of work shall be Monday to Friday inclusive. Ordinary hours shall be worked between 5am and 8pm daily. Maximum length of a single ordinary period of continuous duty shall not exceed 7.6 hours, excluding meal breaks except where agreed in writing.	No provision — see Roster Arrangements.
Part-time hours	No provision — see Award.	See Award — Clause 5.5 — ordinary hours for part-time employees shall be between 7.6 and 30.4 hours per week. Such hours when fixed shall be deemed to be the employee's ordinary hours.	No provision — see Award.
Overtime hours	No provision — see Award.	See Award — Clause 6 — overtime comprises hours worked in excess of 38 in a week, a single period of planned continuous duty in excess of 7.6 hours where no roster is agreed or any hours worked outside the employee's rostered hours.	3.2(a) — included in annualised salary.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
Shift arrangements	No provision — see Award.	See Award — Clause 6 — provides for day, afternoon and night shifts. Shift start and finish times: Day: between 5am and 8pm Afternoon: between 1pm and 2am Night: between 2am and 12 noon. Shifts may be swapped with permission of supervisors and paid as if no change occurred. Workers and supervisors may rearrange one or several rostered shift starting times by agreement at least 24 hours in advance of the proposed shift starting time. Pay to remain same. An employee may be required to transfer from their rostered shift to another shift, provided employee has at least 16 hours' notice of change prior to the starting time of the new shift and has a ten hour break prior to commencing the new shift. 9.4 — Saturday or Sunday work requires a minimum of 3.8 hours' work. Where this is not the case a minimum of 7.6 hours' ordinary time wages shall be paid.	5.3 — effort to be made to minimise occurrences where 10 hour break not provided. No additional payment where no 10 hour break. Unrostered hours will be counted on an equivalent time basis if worked longer than normal shift. 5.5 — practice is to provide a minimum of 12 hours notice to change shifts. Where it is not possible, lesser notice may be given by agreement with employees.
Roster arrangements	No provision — see Award.	7(d) — treatment plant roster identical to underground roster in respect of shift start and finishing times and the cycle, but not in respect of meal breaks and number of days worked per year. An equal time roster will apply and be deemed day work.	5.2(b) — rostered hours with additional hours. Employee's salary takes into account the requirement to work additional hours from time to time. Expected to work reasonable number of unrostered hours depending on operational requirements. Provision for time

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		7(e) — Service personnel will work a 21 day cycle of which 14 days are worked and 7 days are off, generating a payment of 74 hours' pay per week. No additional penalties beyond those contained in agreed roster.	off in lieu if employee works more than predetermined number of unrostered hours in a consecutive 13 week period to meet emergency/ operational requirements. An employee 'called back' will be credited with a minimum of 2 hours to be offset against any additional hours to be worked in that 13 week period. 5.2(c) — employees required to work only rostered hours who are subsequently required to work outside their normal hours will receive time off in lieu. To be used in the next quarter or as part of annual leave. 'Call backs' credited for a minimum of 2 hours. 5.2(d) — certain rosters include provision for the working of flexible hours. Recognised in salary. To be worked at times to meet operational requirements.
Paid breaks	No provision — see Award.	7(a) — underground: — meal break of up to 45 minutes may be taken during each shift at an agreed time. 7(b) — underground: — a rest period of 20 minutes duration or two rest periods of 10 minutes duration will be allowed during each shift. Provision for other arrangements to be made by agreement. 12(c) — employees can accrue a maximum of 3 RDOs to be taken at a mutually agreed time.	5.4 — meal breaks to be taken at mutually agreed time, normally around the middle of the shift.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		See Award 5.7 — paid rest pause of 20 minutes for all employees in the first half of their daily work. Taken so as not to interfere with continuity of work. See Award 9.9 & 9.10 — starting times for crib or meal breaks may be brought forward or delayed for up to one hour without penalties where continuity of production is otherwise affected. Where delayed for more than an hour, the period of delay shall be paid at double time. An employee required to continue working for more than two hours after his ordinary/rostered ceasing time shall be allowed a 30 minute paid crib, and a subsequent 30 minute paid crib after each further four hours worked.	
Annual leave	No provision — see Award.	See Award 13 — shift workers on continuous roster: 35 consecutive days. All other employees: 28 consecutive days. Part time employees receive pro rata entitlement while casual employees receive no entitlement. Leave will accrue on a pro rata basis to employees engaged in work with different annual leave entitlements. Cannot be discharged. Taken at a time determined by the employer within 6 months of accrual after consulting employee. Four weeks notice of leave to be provided to employee. Employee may take leave with employer's approval in a maximum of two periods. May	6.2 — day workers and continuous shift workers entitled to 5 weeks and 2 days per annum. Continuous shift workers entitled to 6 weeks and 2 days per annum. May be accumulated for 2 years. Seven days (public holidays) are anticipated to be worked by employees and thus included in annual leave. If not required to work, annual leave entitlements adjusted. Annual leave to be taken by agreement, or failing agreement, at a time specified by the Company. Leave loading is included in annual salary.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		be taken on a pro rata basis during temporary closures if leave entitlements are insufficient.	
Long service leave	10(b) — 13 weeks' paid leave after 10 years completed service and pro rata after 7 years.	See Award 14 — Thirteen weeks after 10 years service. Pro rata upon termination after 7 years. Taken in a maximum of 3 periods.	6.2 — entitlement equal to 13 weeks after 10 years' service. Accrued entitlement subject to a 'no disadvantage test'. Employee receives the higher of the value between leave under Agreement and previous rate, had the leave been taken immediately prior to the Agreement. Test applies only to accrued or pro rata leave at the date the Agreement came into existence.
Sick leave	10(a) — discretionary sick leave policy will apply with salary, as detailed in the offer of employment, being continued according to length of service, work performance and the individual circumstances of each case.	See Award 15 — 60.8 ordinary time hours per completed year of service. Cumulative to a maximum of 13 weeks in any one year except by agreement. Notification to employer within 5 days of commencement of absence or upon return to work. Where no certificate is produced, satisfactory evidence is to be produced. Sick leave available to an employee who is absent to care for/transport a spouse/child for medical aid. Annual/long service leave disrupted for a minimum of 7 consecutive days due to illness of spouse/child and involving hospitalisation may be substituted for paid sick leave.	6.4(c) — employees unable to attend work due to illness or a non-work-related injury are required to notify their Superintendent of absence and expected duration prior to commencement of the employee's normal rostered shift. Failure to notify will result in non-payment of salary support. Satisfactory attendance to be monitored and poor/ inconsistent attendance to be dealt with through Process to Ensure Effective Personal Behaviour.
Parental leave	No provision — see Award.	12(b) — an employee other than a casual employee shall be entitled to unpaid Parental Leave in accordance with the Australian	

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		Industrial Relations Commission's decision on Parental leave as contained in Prints J3596 and J5512.	
Other leave	No provision — see Award.	See Award 16 — leave of absence without pay — work-related absence not eligible for training leave is subject to approval of employer. All other approved paid absences paid at ordinary time. Approved leave without pay subject to discretion of employer and not available retrospectively. Employee attending to injured person entitled to leave without pay provided they return to work upon completion. See Award 17 — bereavement leave — maximum of three ordinary time working days. Available for spouse (including de facto), child, step child, adopted child, parent, step parent, parent in law, foster or adoptive parent, grandparent, sibling, step sibling, sibling in law. Relatives or other persons not described may be included subject to discretion of employer. Proof to be furnished to employer if required.	6.4(c) — Salary support may be used for Family leave provided prior notification to commencement of shift.
Remuneration and on-costs			
Base pay	9 — Annualised salary based on all work performed, including, for example, all hours worked, shift premiums etc, allowances or any other amount which	Remuneration: Mineworker Level 1 — $421.70/week Mineworker Level 2 — $458.90/week Mineworker Level 3 — $496.10/week Mineworker Level 4 — $520.90/week	3.2 — payment systems — two remuneration systems implemented in the Mining area. All-inclusive annualised salary — replaces all amounts, allowances, penalty rates, overtime payments and any other payments otherwise

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
	otherwise might be payable under the Award. Team leader or Operator/ Technical Specialist — $66 000 Advanced process — $61 000 Basic process — $56 000 New employee — $52 000 An additional amount of $6 000 per annum will be paid to employees working underground on a permanent basis.		due to an employee. Annualised base salary plus a production component — employees paid an annualised base salary plus a production component, replacing all amounts, allowances, penalty rates, overtime payments and any other payments otherwise due to an employee. Indicative all-inclusive annual base salary and production component for seven day continuous shift worker in Mining Operations in the Mining Area for 42 paid hours/ week. Mine Production (MP) Advanced Operator 1 — $93 650 MP Advanced Operator 2 — $77 850 MP Advanced Operator 3 — $74 000 MP Advanced Operator 4 — $70 000 MP Operator 1 — $66 000 MP Operator 2 — $62 000 MP Operator 3 — $58 000 Indicative all-inclusive annualised salary for a Underground Maintenance dayworker in the Mining Area for 40 paid hours per week (5 day, Monday-Friday). Under Ground Maintenance (U/GM) Technical Officer — $55 000 U/GM Advanced Technician — $52 000 U/GM Technician 1 — $48 000 U/GM Technician 2 — $44 000 U/GM Assistant 1 — $40 000 U/GM Assistant 2 — $35 700 Indicative all-inclusive annualised salary for a

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
			seven day continuous shift worker in Underground Maintenance in the Mining Area for 42 paid hours per week. Under Ground Maintenance (U/GM) Technical Officer — $66 000 U/GM Advanced Technician — $63 000 U/GM Technician 1 — $60 000 U/GM Technician 2 — $56 000 U/GM Assistant 1 — $50 000 U/GM Assistant 2 — $45 700 Indicative all-inclusive annualised salary for a Surface dayworker in the Mining Area for 40 paid hours per week (5 day, Monday-Friday): MS Technical Officer — $48 000 MS Technician Advanced — $43 400 MS Technician 1 — $39 000 MS Technician 2 — $36 300 MS Operator — $33 750 MS Attendant 1 — $31 050 MS Attendant 2 — $28 350 Indicative all-inclusive annualised salary for a maintenance dayworker in Ore Handling in the Mining Area for an average 40 paid hours per week (Monday-Sunday): Maintenance Technical Officer — $48 000 Maintenance Technician Advanced — $64 300 Maintenance Technician 1 — $60 200 Maintenance Technician 2 — $56 000 Maintenance Assistant 1 — $46 250 Maintenance Assistant 2 — $41 200

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
Overtime pay	No provision — see Award.	See Award 9.5 — employees to receive a 10 hour break between completing overtime after ordinary work on one day and prior to commencing ordinary work the next day. An absence during ordinary working time the next day, because of such ten hour break, shall be paid at single time. An employee who does not receive 10 consecutive hours off duty between the termination of the employee's ordinary work one day and the commencement of the employee's ordinary work the next day shall be paid double the ordinary time wage rate until released from duty. Applies to shiftwork except where shift rostered exceeds eight hours, a shift worker does not report for duty, or a shift is worked by arrangement between the employees. See Award 9.6 — an employee recalled to work from off site shall be paid double the ordinary rate for a minimum of 3.8 hours. Recalls of less than 2 hours do not require a 10 hour break. See Award 9.7 — employees called out on emergency work shall be entitled to payment for such work and travel time for a minimum of four hours at ordinary time wages. See Award 9.13 — employees may be required to work a reasonable amount of overtime or to provide satisfactory evidence of genuine inability to do so.	

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
Shift pay	No provision — see Award.	See Award 11 — rostered afternoon shifts: hourly allowance of 15 per cent of the Level 3 ordinary hourly rate. Rostered night shift: hourly allowance of 20 per cent of the Level 3 ordinary hourly rate.	3.5 — salary calculated to include where an employee has been nominated to change shifts underground. Additional payments: An employee spending between 15 and 45 per cent of his time underground to receive an amount equal to 30 per cent of the difference between the salary for the Multi Area grade and the underground grade. An employee spending between 40 per cent and 60 per cent of their time underground to receive 50 per cent of the difference between the two grades. An employee spending 60 per cent or more time underground will be classified as an underground employee for salary purposes.
Weekend pay	No provision — see Award.	See Award 9.2 & 9.3 — work performed after 2am on a Saturday which ordinarily forms part of that roster shall be paid at time and a half for the first 7.6 hours. All other cases shall be paid at double time. All work performed on a Sunday shall be paid at double the ordinary time wage rate.	3.2(a) — included in annualised salary.
Annual leave pay	No provision — see Award.	See Award 13 — rostered shift workers paid according to roster/projected roster, including Saturday, Sunday or holiday shifts and payment for one rostered overtime shift per annum.	6.1(e) — included in annualised salary. For employees on annualised salary with production bonus, the six day average principle shall apply for the contract to which the employee is signed on.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
Bonus pay	No provision.	See Award 8 — contract work and bonuses — contract work or bonuses shall be in addition to wage rates contained in Award. Contract and bonus pay rates should exceed the following minimum percentages of the Level 3 ordinary time hourly wage rates: underground — 30 per cent; SX/EW — 15 per cent; all other areas — 5 per cent. See Award 9.12 — contract/bonus payments calculated at ordinary time and are not subject to any penalty payments. See Award 13.8 — bonus/contract payments received for annual leave based on average bonus/contract earnings during 6 full pay periods immediately preceding the taking of annual leave. 10 — bonus payments in effect at time of Agreement shall continue until all trials are completed and agreement reached with all parties to any bonus changes.	3.5(f) — target performance must be achievable. Salary exceeding benchmark achieved where production greater than target. Employees can earn in excess of their preserved salary where performance exceeds targets
Workers' compensation	No provision.	No provision.	No provision.
Sick pay	No provision — see Award.	No provision.	6.4 — salary support — payments made to all Services Area employees in the event of genuine personal illness or injury at the all inclusive annualised salary for the grade for a 40 hour dayworker (including 26 Additional Hours). Maximum of 64 hours per annum and

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
			is cumulative. Accrued sick leave as at 1 January 1994 can be paid out in full during Agreement or upon termination.
Accident pay	No provision — see Award.	No provision.	No provision.
Superannuation contributions	No provision — see Award.	See Award 21 — 6 per cent of the ordinary weekly rate, or at rates prescribed by *Superannuation Guarantee (Administration) Act (Qld) 1992*. Paid to all employees who have been employed for a period of 5 consecutive weeks and worked a minimum of 50 hours. Employees able to make additional contributions.	No provision — see Award.
Severance and retrenchment pay	No provision — see Award.	See Award 20.6 — employment terminated by provision of 2 ordinary working days' notice. 13 — except for details outlined below; the terms and conditions of the Statement of Policy contained in the decision of the Full Bench of the QIRC dated 16th of June 1987 will apply. Severance pay: 1 year or less — $900 1 to 2 years — $2 700 2 to 3 years — $3 600 3 to 4 years — $4 500 4 years and over — $5 000. Relocation only includes employees resident at Gunpowder or Mt Isa irrespective of length of service. Relocation to a point of	4.4 — notice of termination: 1 year or less — 1 week's notice; 1 to 3 years — 2 weeks' notice; 3 to 5 years — 3 weeks' notice; and 5 years and over — 4 weeks' notice. Employees over 45 years of age and with 2 years' continuous service shall be entitled to an additional weeks notice. If appropriate notice is not given, payment in lieu to be made, based on corresponding grade for an employee in the Services area. Fixed-term/ specific task employees to be given one weeks notice. Notice provisions do not apply to casual employees or employees dismissed summarily or for misconduct. Company may withhold monies if employee fails to provide the required notice.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		choice anywhere in Australia. Covers cost of removal of personal effects (with some exclusions) from Gunpowder or Mt Isa. Cost to a maximum of $3 500 (or $4 000 in the case of WA and Tasmania) paid on presentation of receipts by a removalist. Travel allowance of $500 for single employee or $1 000 for employee with spouse/dependants except where moving to Western Australia or Tasmania where allowances are $1 000 and $1 500 respectively. Where full relocation costs are paid by new employer, no entitlement to above.	7.1 — Excess Labour Separation Arrangements — unaltered as per 1995 Framework Agreement. Wage rates increased by Average Weekly Ordinary Time Earnings (AWOTE).
Special rates and allowances	No provision — see Award.	No provision.	3.4(b) — salary of existing employees preserved based on 1995–96 projected total earnings. The salary of employees subject to salary preservation will remain unchanged by future annual salary increases until the salary for the position exceeds the employee's preserved salary. Salary preservation ceases where an employee changes position or roster. Due consideration will be given to restoring an employee's salary-preserved amount where he changes back within 3 months.
Public holidays	No provision — see Award.	See Award 9.8 — employees required to work on a public holiday will be paid 2.5 times the employee's ordinary time wage rate. An employee required to work on a public holiday who fails to do so shall not be	6.3 — employees working continuous shift roster may be required to work Christmas Day, Labour Day, Easter Saturday and Monday in accordance with shift roster requirements.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		paid unless satisfactory evidence is produced detailing genuine inability to attend. See Award 18 — 11 public holidays. Employees not required to work on a public holiday shall be paid at ordinary time. Where public holiday falls during annual/long service leave paid as public holiday and annual/long service leave reimbursed accordingly. 7(f) — Christmas Day, Boxing Day and New years day to be observed as public holidays except where continuity of operations is required. When not specifically rostered on, all non-continuous shift rostered personnel will observe all other gazetted public holidays on the proclaimed day.	
Working clothes and safety boots	No provision — see Award.	See Award 20.12 — employer to provide tools and equipment, including personal protective equipment, required for employee to work effectively. Employer to replace due to fair wear and tear and employee to replace due to negligence. Reasonable value may be deducted from employee's wages if fails to return articles upon termination. 9 — on commencement all employees supplied with 2 sets of clothing/overalls, 1 winter jacket for employees working in the open, and 1 pair of safety gum boots and 1 pair of safety boots or shoes. Clothing/overalls replaced every 12 months,	No provision.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		winter coat replaced every 2 years and other items replaced on a fair wear and tear basis. Safety equipment to be supplied taking into account the requirements of the work involved. Employer to pay $25 toward the cost of hardening each pair of prescription glasses.	
Travel	No provision — see Award.	8 — fly in/fly out arrangements to Brisbane may be raised during the life of the Agreement. In addition to existing arrangements from Mt Isa. Company to provide fuel and maintain existing bus to be utilised as a pick-up vehicle. No change to existing annual air travel entitlements or existing bus arrangements involving community matters during life of agreement.	No provision.
Training costs	No provision.	11 — training can be conducted by any competent employee. Training will be discussed/reviewed during life of Agreement. See Award 8.3 — employees undergoing on-site training shall be paid 50 per cent of the Gunpowder production bonus rate applicable for the duties most closely associated with the training in question. Competent persons conducting on-site training sessions shall be paid 150 per cent of the Gunpowder production bonus rate applicable to the duties most closely associated with the training in question. Duties performed	3.5(c) — no additional payment for delivering training and no adjustment of targets for Production Contract purposes. Employees undergoing training retain all-inclusive annualised salary. An employee on an annual base plus production component who is undergoing training in another Production Contract will not attract any production component. Where such an employee is on a preserved salary will receive 85 per cent of preserved salary while undergoing training.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
		between training sessions shall be paid at the appropriate contract or bonus payment for those duties.	
Other on-costs	No provision — see Award.	See Award 7.3 casual loading of 22.5 per cent. See Award 10 — meal allowance of $7.10 or a meal to be supplied to employees required to work overtime for more than two hours beyond ordinary ceasing time. See Award 12.5 — union /OH&S representatives attending meetings outside normal working hours at request of employer paid at ordinary time wage rate plus the minimum bonus rate. 12(d) — Company house allocated to two persons employed by the Company for share accommodation, only one of the employees shall be assigned the house. In the event that the employee assigned the house is no longer employed by the Company then the employee sharing the accommodation shall no longer be entitled to maintain occupancy or be assigned a house.	3.5(d) — salary adjusted where performing higher duties for more than 4 consecutive shifts. Will receive the higher amount of current grade or 90 per cent of the higher grade. Where undergoing training salary will remain unchanged. 3.5(e) — employees regularly required to undertake higher duties will be nominated by the company and paid an additional $2 000. If filling in for more than 4 consecutive shifts then 90 per cent of the grade salary and the production component for the Production Contract will apply for the full duration. No additional payment other than $2 000 if filling in for 4 consecutive shifts or less. No additional payment where employee undergoing training. 5.7 — payout of flexible credits — paid at rate applicable immediately prior to Agreement. 7.2 — grandfathered financial assistance for medical, hospital and dental expenses above the MIMEHS and Medicare fees to employees joining prior to Agreement.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
Functions, tasks and skills			
Functions	7 — communication with the AWU, Queensland. It is agreed that: An AWU official may participate in six monthly business planning sessions in which the Company's management will discuss the current business and operating environment; There will be discussions between the Company and the AWU prior to annual salary reviews including an assessment of salaries in the metalliferous hard rock mining industry; The Company will provide to the AWU upon request details of the criteria used by it in assessing individual, team and business performance that is to be used in setting remuneration levels; The Cannington Problem Solving Procedure will incorporate a provision permitting an employee who wishes to do so to request the	See Award 12 — employee's representative — appointed job representative upon notification to employer to be recognised as accredited union representative. Allowed to accompany/represent employees in discussions or negotiations related to the terms and conditions contained in Award or make representations to employer in accordance with Dispute Settlement Procedure. See Award 12 .6 — right of entry — as per *Metalliferous Mining Regulations 1985 (Queensland)* and *Section 286 of the Workplace Relations Act 1996* — right to interview employees upon production off written authorisation and limited to meal breaks/non-working hours unless permission otherwise. See Award 12.7 — right of representation for employees upon provision of at least 4 hours' notice.	1.5 — The AWU has representational rights in the Mining Area, excepting the Underground Equipment Workshop, and the AMWU has representational rights in the Underground Equipment Workshop.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
	AWU to assist in the resolution of the problem.		
Job and task demarcation	No provision — see Award.	See Award 4 — Progression through the classification structure is based on the acquisition of skills as identified in the relevant training schedule. Progression to Level 4 requires completion of introductory training and introductory supervisor's courses and approved qualifications in first aid. Maintenance of any classification requires use of all skills in classification level at least once every 12 months or being prepared to undertake a refresher course. Employees classified as Level 3 or 4 who have successfully completed the introductory supervisor's courses and hold an approved first aid qualification may act as relief supervisors for a maximum of three months. See Award 20.11 — at liberty of employer to transfer an employee from one section to another.	4 — flexibility of work — any employee, including staff, can carry out any work which is safe, legal and which they are competent to perform.
Training	No provision — see Award.	See Award 4.2 — Joint Training Committee — responsible for facilitation and review of training programs. Comprises two management and employee representatives. Meet every 3 months.	No provision — see Award.
Qualifications	No provision — see Award.	No provision.	No provision — see Award.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
Procedural arrangements			
Relationship with Award	Unless altered by this Agreement, the provisions of the Mining (Non-Coal) Award — State shall apply.	Agreement to be read in conjunction with the Gunpowder Copper Ltd Award 1996 provided that to the extent of any inconsistency between that Award and this Agreement the latter shall prevail.	Supersedes the Mt Isa Mines Ltd Award in many areas except as identified fully in Appendix A to this Agreement. Where in respect of any remaining provisions in the Mt. Isa Mines Ltd Award there is any inconsistency with this Agreement then the Agreement shall prevail. Certified Agreement shall be read in conjunction with the Mount Isa Mines Ltd — Industrial Agreement — Long Service Leave and where there is any inconsistency, this certified Agreement shall apply. Certified Agreement replaces all other Industrial Agreements in their entirety for the duration of this Certified Agreement.
General	6 — recognition by company — company recognises AWU as the appropriate union to represent, as required, the industrial interests of employees within the scope of this Agreement.	No provision.	3.8 — Personal Effectiveness Review (PER) — provides feedback on performance and forms basis of ongoing training and development programmes. Provides objective ground for assessments related to remuneration, promotion and career development. Carried out six monthly. Parties committed to principle of linking salary to PER on an annual basis. PER supported by training. Complaints concerning PER assessments not considered under Fair Treatment System.
Dispute settlement	Set out in Attachment to Agreement — problem-solving	See Award 19 — subject to provisions of Part VI of the *Workplace Relations Act*	3.8(f) — complaints arising from PER raised with Departmental Manager in first instance.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
	procedure: Matter must first be raised and discussed with the employee's supervisor. If matter remains unresolved, matter discussed with department manager. If matter still remains unresolved, employee may involve General Manager Cannington. Where the matter remains unresolved may be referred to the QIRC (provided it has jurisdiction to deal with the matters).	*1996.* Matter to be discussed initially between employee and immediate supervisor. If not settled matter referred to superintendent of the section. Employee entitled to be accompanied by union representative or official during ensuing discussions. If not resolved, matter formally referred to Operations Manager or Deputy Operations Manager. If agreement not reached within 2 days, issue may be discussed between the employer and the branch or district secretary of the union. If no settlement, the matter may be referred to the AIRC for resolution. Where dispute arises out of change in existing work practice, practice reverts to that in existence prior to the change until a settlement is reached. Normal work to continue during dispute except where injurious to health or contrary to safe working procedures. Continuation of normal work shall not prejudice final settlement.	Right to union representation. If unsatisfied referred to 3 member committee, comprising General Manager Human Resources and 2 nominated Human Resources Superintendents for investigation. Where necessary may be referred to respective General Manager. Joint Steering Committee to meet on six monthly basis to consider procedural problems. 4.3 — employee exhibiting unsatisfactory behaviour will be formally counselled by their supervisor. Required improvement explained. Counselling recorded in writing. Further instance of unsatisfactory behaviour results in a first written warning from supervisor. Further instance of unsatisfactory behaviour results in a final written warning by Superintendent. First and final written warning valid on personal file for two years from date of final warning. Upon further instance of unsatisfactory behaviour following final written warning, employee must show cause as to why employment should not be terminated. Unsatisfactory behaviour not dealt with in isolation from another incident of unsatisfactory behaviour. Right to union representation after receipt of first written warning. Employee may be stood aside for remainder of shift and the following shift with or without pay while incident is investigated. If employee believes unfairly treated, may access Fair Treatment System.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
			Appendix A — Fair Treatment System — employee to discuss concern with supervisor, if unresolved, with Superintendent, then Manager followed by the General manager. May then be referred to the Queensland Industrial Relations Commission. Right to union representation.
Agreement making	No provision — see Award.	No provision.	1.9 — Committees formed for the purposes of this Agreement to maintain an ongoing role in monitoring the Agreement to ensure its effective implementation. 1.10 — parties will commence work towards the extension or replacement of this Agreement to ensure its effective implementation.
Negotiating change	No provision — see Award.	See Award 25 — enterprise flexibility — consultative mechanism and procedure to vary Award. Requires approval of majority of employees, consultation with AWU and requirement that variation does not disadvantage employees terms and conditions. Any reduction in overall terms and conditions cannot be contrary to the public interest.	5.2(c) — Occasions where employees without additional hours built into their salary work unrostered hours, to be reported to General Manager to see if a roster change is needed. 5.2(b) — Managers personally accountable for ensuring that employees do not work excessive unrostered hours. More than 26 additional hours worked in a quarter will be reported to the General Manager. 5.3 — General Manager to receive report each pay of employees who have not received a 10 hour break. 5.6 — agreement to introduce new rosters shall not be withheld unreasonably.

Type of arrangement	*Cannington*[a]	*Gunpowder*[b]	*Mt Isa*[c]
Redundancy	No provision — see Award.	No provision.	7.1 — Excess Labour Separation Agreement (ELSA) provided under Company policy as part of the August 1995 Framework Agreement. ELSA not to be altered for the duration of the agreement.
Payment of wages	No provision — see Award.	See Award 20.9 — paid by EFT into a nominated account.	3.7 — salaries paid twice monthly by EFT into nominated account. Adjustments made in the next mid-point month or upon termination. Production component paid in next pay period after it was earned. To streamline payroll function, employees encouraged to continue normal salary payments while on annual leave. However, requests for payment in advance will be made.
Safety management	No provision — see Award.	9(c) — Company reserves the right to conduct alcohol testing in situations where serious damage or Lost Time Injury occurs as a result of an accident. See Award 12.2 — two employees to be appointed by workforce as OH&S representatives, approved by employer and AWU. Bi-monthly discussions.	

a Agreement made between BHP Minerals Pty Ltd and the Australian Workers' Union of Employees, Queensland. Three year agreement expiring 28 May 2000.

b Agreement binding upon Gunpowder Copper Ltd, the AWU and any contractors or subcontractors performing or executing any work covered by this Agreement on behalf of the Company. Agreement operates from first pay period on or after 6 December 1995 and remains in force until 30 June 1996. Except where stated, clause numbers refer to those in the Agreement.

c Agreement made between Mt Isa Mines Ltd and the AWU and the AMWU. Applies to employees covered by the Mount Isa Mines Limited Award who are employed in the Mining Area. Agreement operative from 1 August 1996 and shall remain in force until 31 August 2000.

Table H.3: **Overview of formal work arrangements in BHP Iron Ore Ltd (WA)**[a]

Type of arrangement	
Size of the work force	
Recruitment	Agreement I Clause 2.2 — positions to be advertised across the site as they become available. Employees required to apply each time a vacancy is advertised. Selection to be based on the best applicant after considering the requirements of the advertised position and the applicant's personal qualities. Short-listed applicants to be interviewed by a Personnel Officer and Area Supervisor. An employee from the receiving area to be involved in the consideration of applicants. Arrangement to apply to transfers from one department to another and from day work to shiftwork positions. Agreement with MEWU that relief shift positions will be filled by seniority. Further discussions to occur regarding other transfers intra and inter-department. Certain positions (based on frequency of vacancies and number of interested applicants) will utilise an interest list and a transfer list. Provisions apply to acceptance and refusal of offers. Agreement II Clause 6 — selection of personnel for entry into the Mining Department will be initially into level 1 and from there applicants who have responded to an advertisement will be assessed according to work, attitude, attendance, timekeeping and past discipline.
Retrenchment	Award Clause 31 — Employer to consider all things being equal (I) the length of service within the employee's classification in the case of tradespersons or CMEWU classifications; and (ii) the length of service with the employer and the employee's competence to perform in the other classification where transfer is involved. When assessing 'all things being equal', employer to consider: qualification and other experience; suitability for other employment; availability of housing or other accommodation; domestic or other compassionate factors; attendance record; general work performed; and the policies of the appropriate unions. Employers and unions to discuss in detail, with intention of reaching agreement, how these procedures are to apply.
Dismissal	Award Clause 5 — period of notice: 1 hour for casual employees; or either 7 consecutive days counted from the time notice is given or five ordinary time shifts which, if the notice is given not later than one hour after the commencement of an ordinary time shift, shall include that shift (whichever is the shorter of these periods).
Use of casuals, contract employment and contractors	Agreement I Clause 3.3(v) — casual employees engaged on an hourly basis for a minimum period of 3 hours in work agreed with the union(s). Casual employees will not be appointed for a period in excess of 4 continuous weeks. Employees may be engaged for a short duration to meet the needs of the Company as agreed with the union(s). Unless agreed otherwise a maximum term of 6 months applies, upon which the Company is to consider making them permanent. Short-term employment not to be used in lieu of acting opportunities for existing employees or to offset the career opportunities of Company employees. Employees appointed

Type of arrangement	
	in Perth to be provided with return airfare to Perth on satisfactory completion of their contract while local appointments to receive 2 days' pay to assist in pursuing alternative employment. Agreement II Clause 5.5.4 — provision for services of explosives vendors in the form of 'specialised' loading applications. Provision for Company to inform Blast Crew and the Union(s) prior to the use of such services. Agreement II Clause 11.4 — provision for short-term employees in Mining Department during school holidays. Limits period of engagement according to time of year. Agreement II Clause 5.1.2.3 — provision to use small numbers of contractors for work over longer periods of time on a particular task in the Mine Maintenance area. In particular, contractors may be used for construction, modification, project, specialised and warranty work as required. In addition, contractors may be utilised for surges in peak workloads including major breakdowns, accident damage and to reduce backlog as required. Company to provide union(s) and work groups with notice and details of contractors. Contractors may also be utilised for non-core activities — specified in Appendix 2 as: servicing and maintaining photocopiers, specified workshop equipment, transformers, electric overhead travelling cranes, monorails, mobile slewing cranes/buses, refrigeration and airconditioning to office building and workshop and glass repairs/replacement and contractors to provide fuel and lubrication at Newman Airport.
Manning levels	Agreement II Clause 7 — numbers of trainees in each level and on each skill in the Mining Department to be based on operational requirements. Agreement II Clause 5.1.4 — Number of engine drivers working at Power Station to be reduced from 16 to 12 (or 3 per shift) by transfer and/or voluntary redundancy. To maintain shift manning, the Company may employ short-term employees for leave coverage. May be a requirement to move employees from one shift to another.
Hours of work and roster arrangements	
Contract of employment	Agreement III Clause 2 — condition of employment that every employee at the Mt Newman Joint Venture comply with the terms of the Industrial Relations Agreement (Revised 1997).
Ordinary hours	Agreement I Clause 3.3(v) — All time worked in excess of 8 ordinary hours per day shall be deemed overtime. Other conditions to apply on a pro rata basis.
Part-time hours	Agreement I Clause 3.3(v) — A casual employee required to work in excess of 8 hours in any one day or 40 in any one week shall be paid overtime at the applicable rate. Provision for part-time employment upon union(s) agreement and comprising a minimum of 8 ordinary hours any day and less than the ordinary hours per week.

Type of arrangement	
Overtime hours	Agreement II Clause 10 — failure by an employee to report for work after accepting an offer of overtime disqualifies an employee from consideration for the following 2 rotations except in exceptional circumstances. Consistent failure to report for overtime after accepting offers will result in disqualification. Appendix 3 establishes procedures.
Shift arrangements	Agreement II Clause 3.3(iv) — Award provisions which prevented the implementation of new and different shift arrangements ceased to apply. Rosters based on shifts of 8 to 12 hours may be introduced under the following conditions: - rosters are implemented for a 12 month trial period; - proposed rosters and trial details are agreed between the parties; - trials are without prejudice to future general Award conditions not contained in this subclause; - Award will be varied by agreement by the parties so that such alternative shift systems are implemented; - trial problems will be discussed by the parties and if unresolved processed in line with the Industrial Relations Agreement; - with the agreement of the parties a trial may be aborted if it is not working and previous arrangements reinstated; prior to the end of the trial a formal review is to occur whereby the alternative shift roster may be adopted, previous arrangements reinstated or other options examined; - the parties genuinely intend to give such arrangements a fair and balanced opportunity to be assessed; and - the parties will not use such trials to pursue alternative shift roster arrangements without similar conditions being met. 12 hour shift systems introduced in Mining, Ore processing Production and Ore Processing Shift Maintenance. Conditions apply. Agreement II Clause 5.1.3 — sets out shift structure within ore processing.
Roster arrangements	Agreement I, Clause 3.4 — 12 hour, 2 shift 4 panel shift system introduced in favour of eliminating smokos on the current 4 panel, 3 shift 8 hour shift system in order to increase operating hours of major equipment.
Paid breaks	Agreement I, Clause 3.3(iii) — employees who work 1–1.5 hours to 2 hours' overtime immediately after completion or 2 hours prior to the commencement of the rostered shift shall receive a 15 minute rest break immediately prior to commencement of the overtime. If an employee works 2 hours of overtime immediately following the rostered shift they shall receive an additional payment of 20 minutes at overtime rates if no additional crib break is taken since the mid-shift crib break. An employee required to work 4 hours overtime immediately after their rostered shift shall receive a 15 minute rest break and be paid for 4.5 hours at overtime rates prior to commencing the overtime. He shall also receive a meal ticket in lieu of an overtime meal and a 30 minute break. An employee required to work 4 hours' overtime prior to commencing their shift without receiving 4 hours' notice shall receive a 30 minute crib prior to commencing their shift and be supplied with an overtime meal. An employee working between 4 to 8 hours' overtime immediately after the rostered shift shall receive a 15 minute rest break prior to commencing their shift, take the breaks allowed to the employees rostered on that shift and receive a meal ticket. Where afternoon or night shift is worked for

Type of arrangement	
	the purpose of periodic overhaul, afternoon shift shall receive 2 ‘smoko’ breaks of 15 minutes each, a half hour meal break and a meal ticket. Night shift shall receive 2 ‘smoko’ breaks of 15 minutes each, a meal and a half hour meal break, and a meal ticket.
Annual leave	Award Clause 23 — period of 25 rostered shifts or rostered days leave (with payment of wages for 190 hours) after a period of 12 months’ continuous service. Seven day shift workers receive an additional five roster shifts (with payment of wages for 38 hours). Agreement III Clause 6 — maximum of 10 days annual leave may be taken as single days or in periods of less than 1 week. At discretion of supervisor based on requirements and included in limits of the number of employees on leave at any time. Agreement III Clause 7 — Travel Assistance — an employee’s spouse and children may claim travel assistance independently of the employee. Non-cumulative.
Long service leave	Award Clause 25 — entitlement of 1.3 weeks for each 12 months of continuous service (where the definition of continuous service is specified) but there is no entitlement until the completion of 5 years of service. Restrictions on how leave can be taken.
Sick leave	Agreement I Clause 2.3(i) — employees to notify Department of absence prior to commencement of shift. Provision to consider extenuating circumstances which prevent this. A medical certificate is required after 2 single day absences in a year. Award Clause 26 — entitlement of 76 ordinary hours in each year of service, cumulative.
Parental leave	Agreement III Clause 5 — Special leave — where an employee’s spouse or child leaves the site for medical reasons, employee entitled to maximum of 40 hours paid leave in a year. Maximum of 2 days carers leave where employee’s spouse or single parent employee’s child is ill or in an accident. Day workers may also utilise up to 24 hours and shift workers may use up to 16 hours. Special leave and sick leave limited to 40 hours per year. Annual leave or unpaid special leave available if additional leave required. Satisfactory proof to be provided.
Other leave	Agreement II Clause 2.3 — Special Leave — 40 hours off site leave per year available to 12 hour shift employees. Any unused portion may be utilised for special leave on site. Annual leave or unpaid special leave available if additional leave required.
Remuneration and on-costs	
Base pay	Agreement I Clause 4 — Aggregate wage introduced. Base Payment comprises Ordinary Hours, Group 1 Disability, District Allowance, Service Allowance and Medical Subsidy. Four Panel Shift Work Payment comprises Shift Allowance, Shift Change, Public Holidays, Public Holidays in lieu, 20th shift Accrual, Penalty Shifts, LDO Buyout, Annual Leave and Long Service Leave (LSL) with Loadings. Three Panel Shift Work Payment comprises Shift Allowance, Shift Change, Public Holidays, Public Holidays in lieu, 20th shift Accrual, Penalty Shifts, LDO Buyout, Annual Leave and LSL with Loadings.

Type of arrangement	
	Day Work payment comprises Meal Break, LDO Buyout, Annual Leave and LSL with Loadings. Aggregate salary for Days classifications ranges from $31 942 to $45 909. Aggregate salary for 4 panel ranges from $43 908 to $51 979 (applies only to AWU classifications). Aggregate salary for 0.25 4 panel ranges from $43 428 to $62 500 (applies to AWU, CMETU Cranes, MEWU and AEEFEU classifications). Aggregate salary for 0.50 4 panel ranges from $44 694 to $64 431 (applies to AWU, TWU, Prod Worker, MEWU and AEEFEU classifications). Aggregate salary for 3 panel ranges from $41 262 to $59 086 (applies to AWU, TWU, MEWU and AEEFEU classifications). Aggregate salary for 2 panel ranges from $36 142 to $47 804 (AWU and MEWU classifications). Agreement II Clause 2.2.2 — income maintenance calculations for Mine Maintenance classifications. Agreement II Clause 6 — details of salary schedules for first and second 6 per cent increase in pay. Agreement II Clause 7.4 — if there is substantial breakdown of support for the Continuity Agreement by a workgroup, that workgroup will be advised that the Company wishes to review the implementation of the second 6 per cent increase for that workgroup only. Agreement III Clause 9 — details of salary schedules for first 5 per cent increase and second 4 per cent increase.
Overtime pay	Award Clause 10 (2) — all time worked in excess of ordinary hours paid at double time. However, time worked by a continuous shift worker in excess of ordinary hours of work paid for at ordinary rates if it is due to private arrangements between employees themselves.
Shift pay	Agreement I Clause 4 — Aggregate wage introduced.
Weekend pay	Award Clause 13 — all time worked on a Saturday or Sunday paid at double time. All time worked by continuous shift workers at ordinary hours paid at time and a half on a Saturday and double time on a Sunday. Additional rates paid to shift workers who work on the weekend.
Annual leave pay	Award Clause 23 — to comprise the pay that the employee would have received for 7.6 hours immediately prior to proceeding on leave; 25 per cent of that pay; and his/her service pay. Continuous shift workers: pay to comprise the amount (including shift penalties and payment for the 20th shift but not including the service pay) which they would have earned during the roster period; 20 per cent of the above; and service pay.
Bonus pay	No provision.

Type of arrangement	
Workers' compensation	No provision — provisions of *Workers' Compensation Act* to apply.
Sick pay	Award Clause 26 — payment prescribed in First Schedule (wages plus service pay and district allowance on the basis of 8 hours or 7.6 hours as nominated by employee for each day or shift of sick leave).
Accident pay	Award Clause 26 — Sickness and Accident Scheme established with benefits payable under certain circumstances.
Superannuation contributions	Agreement III Clause 8 — BHP Iron Ore Employees' Provident Fund preferred in house fund. Company contributions to increase by 1 per cent to 9 per cent. Pending satisfactory operational performance, further increase of 1 per cent available in either superannuation contribution or aggregate wage rates. Agreement II Clause 2.4 — employees provided with the opportunity to sacrifice part of their future earnings to be paid as additional employer contributions to the BHP Iron Ore Employees' Provident Fund. Conditions apply.
Severance and retrenchment pay	Award Clause 31 — retrenched employees entitled to: 152 hours' pay, plus 38 hours' pay (including service pay) for each complete year of service; and payment at rate prescribed in First Schedule. Employees entitled to pro rata payments in accordance with award. Employer also to pay for transport of employee and their dependants and personal effects back to original place of engagement or to new place of employment within Australia.
Special rates and allowances	Agreement III Clause 9 — Award Allowances not included in Aggregate Wage — Meal provisions — $8.20 or voucher; NACA — Mine — $0.18 per hour; NACA Loadout tunnels — $0.11 per hour, SMR — $0.40 per hour; House Drains — septics — $4.60 per day; EPCO sewerage tank — $4.60 per day; HIAB certificate — $3.80 per week; HIAB motor vehicle — $10 per week; Plumber's registration — $17.70; Electrical SECWA "B" licence — $16.30 per week; Electrical Dual Licence — $16.30 — per week, Electrical Restricted licence — $7.60 per week; Concentrator — $0.34 per hour; Shift tradesperson — $15.30 per week; Unsupervised shift tradesperson — $11.40 per week; Construction allowance — $4.90 per week; Rigger/scaffolder — $7.10 per week; Rigger/certified scaffolder — $13.40 per week; Height money — $1.90 per day; Leading hand 2–5 — $33 per week; Leading hand >5 $40.80 per week; Driver coordinator — $4 247.90 per annum; and Jimblebar Junction — $2 792.50 per annum. Further 4 per cent increase to above allowances provided in Agreement. Agreement II Clause 5.4 — Leading Hand allowance in recognition of removal of union restrictions. Tool allowance to form part of aggregate wage.

Type of arrangement	
Public holidays	Award Clause 12 — time worked on a public holiday other than by a continuous shift worker (during which the time would have been ordinary hours) shall be paid at the rate of double time. In addition, employee is to receive 7.6 hours leave with pay to be taken in conjunction with next annual leave (unless agreed otherwise). Otherwise, time worked on a public holiday to be paid at rate of double time and a half. Time worked on a public holiday by continuous shift workers to be paid at double time plus shift allowance. All overtime to be paid at the rate of double time and a half plus appropriate shift allowance. In addition, continuous shift workers receive 8 hours leave with pay for each occasion their RDO falls on a public holiday. When continuous shift worker works in excess of five public holidays in any one year, he will receive 7.6 hours leave with pay for each public holiday.
Working clothes and safety boots	Award Clause 17(8–10) — Employer to provide sufficient supply of protective equipment (for example, helmets, hand screens, goggles, glasses etc). Employees to sign acknowledgment of receipt and be responsible for equipment. Each employee to be issued, free of charge, two pairs of safety footwear during each year of service and four sets of working attire.
Travel	Agreement II Clause 2.5 — the removal of personal effects on termination will be on a distance equivalent basis to locations other than Perth.
Training costs	Award Clause 37 — Management will make training available to employees which will assist in the individual's career progression, enhance his portability of skills, improve productivity and meet the operational needs of the Company.
Other on-costs	Agreement I Clause 3.5 — joint task team established to generate alternative crib arrangements to the current meals service. Agreement II Clause 2.1 — catering — price of a meal ticket to an employee will increase to $2.40 on implementation of the Agreement and will increase to $3.60 at the commencement of the second 12 months of the Agreement.
Functions, tasks and skills	
Functions	Agreement II Clause 5.1.2 Appendix 4 — provides details of job description and skills required on Mineworker levels 1 to 3. Appendix 5 — Service truck operator may join mineworker classification set out in Appendix 4 or perform duties set out in this appendix. Appendix 6 — Checkpoint Accountabilities: sets out general requirements of all jobs (for example, work safely). Agreement II Clause 5.1.5 Appendix 1 — provides details of job description and skills required for Mine Planning — Mineworker levels 1 to 3.

Type of arrangement	
Job and task demarcation	Agreement I Clause 2.1 — provision for elimination of demarcations including within and between unions, within and between areas of the operations, between Shift workers and Day workers and within and between classifications and classification streams. Agreement I Clause 3.1 — general demarcations eliminated as part of efficiency measures. Agreement I Clause 3.3 — specific demarcations eliminated in the Mining Department. Agreement I Clause 3.4 — specific demarcations eliminated in Ore Processing. Agreement I Clause 3.6 — specific demarcations eliminated in Maintenance Classifications. Agreement II Clause 5.1.1 — further elimination of demarcations in the Mining Department. Progress in classification structure related to the attainment of essential skills, base skills and advanced skills. Agreement II Clause 7 — progression between levels is dependant on the employee's ability to meet the competency requirements for each skill set by the Training Committee. Agreement II Clause 5.1.2 — further elimination of demarcations in the Mine Maintenance area. Agreement II Clause 5.4 — No restrictions to be imposed by any unions on employees wishing to volunteer to accept position of Leading Hand.
Training	Agreement II Clause 5.6 — no training lists. Interested employees will need to apply each time an advanced skill is advertised. Selection is based on obtaining the best person for the job after considering attendance, safety record, discipline, work performance and attitude. Agreement II Clause 7 — provision for written and performance testing. Agreement II Clause 8 — provision for the establishment of a Training Committee for the mining operation. To comprise up to 4 company representatives and up to 6 union representatives. Training Committee to oversee the new classification structure and oversee and review training delivery or skills acquisition. Disagreements to be progressed in accordance with the Industrial Relations Agreement 1989.
Qualifications	Agreement II Clause 5.7 — an employee in the Mining Department unable to meet consistently the standards required of a classification or who is unwilling to participate in training required by the Company to fulfil requirements to be referred to the Training Committee, or if a consistent occurrence then the employee will be reclassified downwards.
Procedural arrangements	
Relationship with Award	Agreements I, II and III shall, to the extent of any inconsistency, supersede, replace and prevail over the provisions of the *Iron or Production and Processing (Mt Newman Mining Co Pty Ltd) Award* No A29 of 1984.

Type of arrangement	
General	Agreement II Clause 5.1.4 — Process established to assist in closure of power station.
Dispute settlement	No provision.
Agreement making	No provision.
Negotiating change	Agreement III — 3 — Ongoing Change Agreement II: 1. Company may originate change; 2. Unions to be notified of any issue/change — written notification to both State and site representatives; 3. Without prejudice discussions if required (30 days maximum); 4. If agreement reached, implementation of change; 5. If disagreement, Company may either decide not to proceed with change or conduct a trial period; Company may nominate trial period of between 1 to 6 months depending on the issue; and 6. After the completion of the trial period the Company may decide to proceed or not to proceed to full implementation. Agreement III — 4 — Continuous Improvement — work group level processes, systems or structures to be instituted to explore opportunities to improve efficiency within the work group, identify performance levels against Key Performance Indicators, examine means to achieve and monitor such performance levels, and implement changes in accordance with SELL principle (Safety, Efficiency, Legality and Logic). Agreement II Clause 5.4 — Acting staff: further discussions to take place to finalise matter.
Redundancy	Award Clause 31 — employee is deemed redundant if surplus to requirements as a result of technological change, merger, takeover or reorganisation of work or production methods or procedures or to market conditions but not if terminated for misconduct or unsatisfactory service nor if offered but fails to accept appropriate alternative employment with the employer. Before any employee is retrenched, employer to give written notice to State Secretary of Union concerned, stating reasons for intended action, the numbers and classifications of employees likely to be involved, and the proposed order of terminations. Individual employees likely to be made redundant then advised in writing by employer. Employees to receive at least three months' notice but pay in lieu thereof shall not be paid where employee resigns prior to expiration of notice.

Type of arrangement	
Payment of wages	Agreement I Clause 4 — aggregate wage to be paid in equal fortnightly payments and will be varied only on a fortnightly basis by payment of overtime at the rate applicable to each level, payment of allowances not included within the aggregate wage and deductions of unauthorised absences or unpaid leave at the rate applicable to each level for the period of such absences.
Safety management	Award Clause 32 — process established for cyclones. Award Memorandum of Agreed Arrangements — safety code established.

a Agreement I operative from 24 July 1993 for a period of 2 years and applies to employees of BHP Iron Ore who are covered by the *Iron ore Production and processing (Mt. Newman Mining Co Pty Ltd) Award* No. A29 of 1984.

b Agreement II operative from 25 November 1995 for a period of two years.

c Agreement III operative from 25 November 1997 for a period of two years.

I US BLACK COAL AGREEMENTS

This appendix presents an overview of formal work arrangements in unionised and non-unionised black coal mining workplaces in the United States. It should be noted that unionised mines account for a relatively small proportion of all black coal mines in the United States.

The formal arrangements governing unionised black coal mining workplaces are presented in Table I.1. These workplaces operate under the umbrella of the *National Bituminous Coal Wage Agreement of 1993*. Because the *National Labour Relations Act* (NLRA) excludes supervisors and managerial employees, this agreement covers only the US equivalent of the Australian production and engineering workforce.

Documentation of the formal arrangements governing non-unionised mine sites is problematic, since non-union workplaces are obliged only to meet legislated minimums and the system is based largely on common law contractual arrangements.

I.1 Legislated workplace standards

There are a number of legislative requirements which must be met by both unionised and non-unionised black coal workplaces in the United States. In particular, the *Fair Labor Standards Act* sets a minimum wage and minimum overtime rates of pay. The minimum wage is currently $US5.15 per hour (as of 1 September, 1997). Increases in the minimum wage are passed in a bill by Congress and signed into law by the President. This wage applies to employees of enterprises with turnover of at least $US500 000 per year. It also applies to employees of smaller firms if the employees are engaged in interstate commerce or in the production of goods for commerce. In addition, the Act has a sub-minimum wage for employees under the age of 20 years of age. This is currently $US4.25 per hour and applies for their first 90 consecutive calendar days of employment with an employer. The Act does not place a limit on the total hours which may be worked. However, it does require that covered employees, unless otherwise exempted, be paid not less than one and one half times their regular rates of pay for all hours worked in excess of 40 per week.

The *Fair Labor Standards Act* seeks to protect the educational opportunities of youths and prohibits their employment in jobs and under conditions detrimental to their health and well-being. The Act includes restrictions on the hours of

work and occupations for youths under the age of sixteen and declares certain jobs as being too dangerous to be performed by minors under the age of eighteen. The black coal industry is one such declared area.

The *Employee Retirement Income Security Act* governs certain activities of most employers who have pension or welfare benefit plans. Pension plans are established and maintained to provide a retirement income or to defer income until termination of covered employment or beyond. Welfare plans are established and maintained to provide health benefits, disability benefits, death benefits, prepaid legal services, vacation benefits, day care centres, scholarship funds, apprenticeship and training benefits, or other similar benefits. Pension and welfare plans must meet a wide range of fiduciary, reporting and disclosure requirements.

Other statutes which set workplace standards include the following.

The *Immigration and Nationality Act* restricts employment to persons who may legally work in the United States (citizens and nationals of the United States and aliens authorised to work in the United States). The Act protects US citizens, and aliens authorised to accept employment in the United States from discrimination in hiring or discharge on the basis of national origin and citizenship status.

Protection is afforded to 'whistleblowers' under a number of environmental Acts. The Acts prohibit an employer from discharging or discriminating against employees in relation to the disclosure of safety and health hazards to their employer or to the appropriate federal agency.

The *Family and Medical Leave Act* (FMLA) provides an employee with up to 12 weeks protected, unpaid leave during any 12 months for the birth and care of the employee's child or placement for adoption or foster care of a child with the employee. In addition, the entitlement includes caring for an immediate family member who has a serious health condition or an employee's own serious health condition. Employees do not accrue benefits during periods of unpaid FMLA leave but must be returned to employment with the same benefits at the same levels as existed prior to the commencement of leave.

The *Uniformed Services Employment and Reemployment Act* provides those who have served in the armed forces the right to re-employment with their former employer.

The *Worker Adjustment and Retraining Notification Act* applies to employers with 100 or more employees, not counting employees who have worked less than 6 months in the last 12 months and not counting employees who work an average of less than 20 hours a week. The Act requires an employer to provide

60 calendar days' notification of plant closings and mass layoffs. This time frame is designed to provide workers and their families with some transitory time to adjust to the loss of employment and to search for alternative employment.

The *Employee Polygraph Protection Act* applies to most private employers. The Act generally prohibits the use of lie detector tests either for pre-employment screening or during the course of employment.

The *Consumer Credit Protection Act* is designed to protect employees from dismissal because their wages have been garnisheed to repay a debt. The Act also limits the amount able to be garnisheed from an employee's wages in any one week.

The *Federal Mine Safety and Health Act of 1977* (the Mine Act) covers mine operators and miners throughout the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, Guam and the Trust Territory of the Pacific Islands. Under the Mine Act, the Mine Safety and Health Administration (MSHA) performs four annual inspections of underground mines and two annual inspections of surface mines. Any violations discovered during inspections and investigations are to be cited and are subject to civil penalties. All violations must be corrected within the time frame established by the MSHA. MSHA's regulations arise from the requirements of the Mine Act. These regulations cover health and safety standards designed: to prevent the occurrence of hazardous conditions; for the immediate notification of accidents, illnesses and injuries; for training programs to meet the statutory requirements of the Mine Act; and to obtain approval for certain equipment used in gaseous mines.

The *Black Lung Benefits Act* (*Title IV, Federal Mine Safety and Health Act of 1977, as Amended*) covers present and former coal miners and their surviving dependants. Basic monthly benefits available to eligible claimants as of 1 January, 1997 range from $US445.10 per month to a maximum of $US890.20 per month for claimants with 3 or more qualified dependants. These rates are adjusted periodically in line with percentage increases in Federal pay. Black lung claims existing prior to 1970 are met by the Black Lung Disability Trust Fund. Claims based on employment after 1970 are met by coal mine operators either directly or through insurance.

Table I.1: **Overview of formal work arrangements in the *National Bituminous Coal Wage Agreement of 1993*[a]**

Type of arrangement	*Article*	*Agreement provision*
Size of the workforce		
Recruitment	*IA(d)*	Right to hire is vested exclusively with the employer.
	II(A)	JOBS Program designed to achieve job security for classified employees through extended panel rights and training. Detailed provisions including: the first 3 of every 5 job openings at any existing, new, or newly acquired non-signatory mine of the employer to be filled by classified laid-off employees covered by the agreement or by active employees who have expressed an interest; and the order of selection from laid-off and active employees by seniority (provided these employees have the ability to do the job) and by geographic location (ie first from those employees located in the district where the other operation is located, second from contiguous districts and third from non-contiguous districts).
	II(D-2)	When the above hiring process is exhausted, union to provide a list of qualified miners for consideration but with no obligation on employer to hire.
	III(k)	No person under 18 years of age to be employed inside any mine or in hazardous occupations outside any mine. If State law provides a higher minimum age, then the State law is to prevail.
	XVII(d,e & f)	Employees who are idle because of a reduction in the workforce shall be placed on a 'panel' from which they shall be returned to employment on the basis of seniority as defined in article XVII(a). A panel member shall be considered for every job which he has listed on his lay-off form as one to which he wishes to be recalled. Panel members can revise panel form once a year. Superintendent of the mine and the recording secretary of the local union to be the joint custodian of the panel records. Laid-off employee is obliged to keep custodians informed of any change of address. Employees notified of recall by certified mail at last known address have right to accept or reject a job which becomes available. However, if the offer has been listed as one to which he wishes to be recalled and the employee rejects the offer or fails to respond within 4 calendar days after receipt of such notice, or accepts but fails to report for work within a reasonable time, his name shall be removed from the panel and he shall sacrifice his seniority rights at that mine. Employees who are placed on a panel shall retain the seniority earned prior to their lay-off and, in order to protect relative seniority standing, will continue to accrue seniority while on the panel. Laid-off employees who place their names on panels at other mines shall not accrue seniority on panels other than their own.

Type of arrangement	*Article*	*Agreement provision*
	XVII(h)	Provisions setting down the order of recall from persons on lay-off status — when a job or training vacancy exists which is not filled by employees within the active workforce or from the mine panel, panel custodians to review the list of employees on the panel from other mines and employer to recall the senior employee with the ability from employer's other mines (1) within the same UMWA district (2) within geographically contiguous UMWA districts (3) from remaining UMWA districts on the panel at that mine and who has listed the job to be filled as one for which he wishes to be recalled.
	XVII(i)	Job bidding — the filling of all permanent vacancies and new jobs created during the term of the agreement to be made on the basis of seniority. Set process to be followed: (1) display of job or vacancy posted in conspicuous place in the mine for period of 5 days; (2) any employee can bid on the vacancy during the 5 day posting period while eligible laid-off panel members who have listed the job are presumed to have bid on the basis of seniority; (3) at the close of the posting period, the most senior employee of those in (2) is selected. Processes (4) to (11) set down arrangements to be followed in certain circumstances (eg. if the job is in a less dusty area, the most senior worker who holds a letter from the US Department of Health and Human Services advising that he/she has contracted black lung disease has the option to transfer to this job ahead of those who do not hold such a letter).
	XVII(j)	If a job vacancy is not filled by job bidding, then job may be filled by hiring a new applicant who has the ability to perform the work. If this is not successful, a training opportunity is to be posted for a period of 7 days. Employee to be trained is to be selected from applicants in accordance with article XVI(g).
	XVII(k)	Transfer to other mines — when a mine is being abandoned or closed, employees whose names are on the panels of other mines shall be transferred to other mines where work is available (at same level position) but seniority at new mine not to begin until the date they commence work (except where employees from mine being abandoned or closed are required to remain to assist with closing and dismantling work, in which case they have the right to transfer later and their seniority will be retrospective to the day they would have been transferred had they not remained).
Retrenchment	*IA(d)*	Right to discharge is vested exclusively with the employer.
	XVII(b)	In all cases where the workforce is to be reduced, employees with the greatest seniority shall be retained provided they have the ability to perform available work.
	XVII(k)	Employees who are laidoff can choose to be placed on the panel of other mines of the same employer in the same UMWA district and choice of other districts provided that request is made in writing within 5 calendar days after

Type of arrangement	*Article*	*Agreement provision*
		their lay-off. (Signatory companies to the agreement and subsidiaries of own employer are treated as the employer for panel rights purposes.)
Dismissal	*IA(d)*	Right to discharge is vested exclusively with the employer.
	XXIV(a)	No employee may be disciplined or discharged except for just cause. The burden shall be on the employer to establish grounds for discharge in all proceedings.
Retirement	*XXII(f)*	No employer to have a policy of compulsory retirement based solely on age for employees covered by the agreement.
Use of casuals and contractors	*IA(g)*	Limits on contracting and sub-contracting on: (1) transport of coal — allowed only where contracting out of this activity is consistent with prior practice and custom and provided that such work is not contracted out when employees who customarily do such work are laid off; (2) repair and maintenance work — not to be contracted out except where work is performed by supplier or manufacturer under warranty (in such cases on written request on a job-by-job basis) or where employer does not have equipment available or regular employees (including laid-off workers) with necessary skills not available; (3) rough grading in mine reclamation work — no contracting allowed; (4) where contracting out is permitted, prior custom and practice shall not construe employer's choice of contractor.
	IA(i)	Construction work — construction work customarily performed by classified employees is not to be contracted out unless such employees with the necessary skills are working no fewer than 5 days per week or its equivalent for employees working on other schedules. Where contracting out is permitted, it shall be in accordance with prior practice and custom.
	II(B)	Employer cannot lease, sub-lease or license out of any bituminous coal lands, mines or other facilities unless numerous detailed conditions are satisfied. These conditions include that the lessee-licensee agrees in writing to offer employment first to employees in employer's operations covered by the agreement and order of selection is as for article II(A) above.
Manning levels	*V*	Provisions relating to circumstances in which full-time helpers on face equipment in underground mines are or are not required.
	XXI(b)	Provisions relating to manning of surface mining equipment. Acknowledgment of continuation of past custom and practice in provisions.

Type of arrangement	*Article*	*Agreement provision*
Hours of work and roster arrangements		
Ordinary hours	*IV(a)*	Basic Work Week — starts at 12.01 am Monday.
	IV(b)	Basic Work Day: (a) Inside employees — 8 hours (or 40 hours per week) from portal-to-portal (or collar-to-collar or bank-to-bank) including a staggered 30 minutes without any intermission or suspension of operation throughout the day; (b) Outside employees — 7 hours and 15 minutes (or 36.25 hours per week) including a staggered 30 minutes without any intermission or suspension of operation throughout the day but may be extended to 8 hours if the work involves dumping, handling or preparation of coal and the manufacture of coke provided overtime is paid for work in excess of 7 hours and 15 minutes per day; and (c) Outside continuous employees — 8 hours (or 40 hours per week) including a staggered 30 minutes without any intermission or suspension of operation throughout the day.
Part-time hours		No provisions.
Overtime hours	*IV(d)*	Employer has full rights to schedule mine operating times, crews etc. However, employees are to be given the opportunity to share the overtime and work on premium days on a fair and equitable basis.
Shift arrangements	*VI*	Employer has right to work mines for extra shifts with different crews.
	VIII	Each shift to have regular starting time established in accordance with past practice and custom. Staggered starting time option available where employees must be lowered into the mantrap or for those employees who perform safety, maintenance or other functions essential to the safe and efficient operation of the mine or surface facility. Starting times in surface facilities do not have to be the same as for the mine. Employer has right to change crews at the face and to require reasonable amounts of overtime necessary to allow this to occur.
	XVII(n)	When a permanent vacancy or new job is filled at a mine where shift rotation is not practiced, the employee with the greatest seniority shall be given their shift preference (ie. day, afternoon, midnight) in accordance with same process as job bidding process.
	XXI(g)	Swing shift — to be used for stripping shovels, draglines, overburden drills and all other classifications which regularly work 7 days a week. When operator uses a swing shift, the regular crew shall be assured of 6 days each week except weeks in which holidays occur.
	XXI(i)	Upon approval of two-thirds of the local union members at the mine, a surface mine employer may elect to extend the work day of employees who mine and load coal to 8 hour shifts — provided that the employees on 8 hour shifts are regularly paid a minimum of three quarter hours of overtime at applicable rates and that work on the seventh day

Type of arrangement	*Article*	*Agreement provision*
		remains optional. Prior to implementation, employer and union agree to share overtime equally and that swing crews are utilised in accordance with XXI(g).
	Appendix C (Part 1)	Alternative schedules — notwithstanding the traditional work schedule set down in article IV, the employer may establish 7 day continuous operations consistent with the schedules set forth in this appendix, provided that the overall employment level at the operation is increased (subject to some exceptions) and mandatory overtime is eliminated. Where an employer establishes alternative schedules, conditions apply on (a) weekend/holiday schedules; (b) overtime for weekend/holiday crew; (c) holidays for weekend/holiday crew; (d) paid time off for weekend/holiday crew; (e) modified weekday schedules; (f) overtime for modified weekday crew; (g) paid time off for modified weekday crew; (h) bereavement; and (i) taking of contractual days.
	Appendix C (Part 2)	Other alternative schedules — employer or the local union has the right to propose other alternative schedules in addition to those proposed in Part 1 above. Local union membership must ratify and the overall employment level at the operation must increase and mandatory overtime must be eliminated.
	Appendix C (Part 3)	Notice of changes — where employer has established alternative schedules (under part 1 or 2 of Appendix C), the employer has the right to change the scheduled workday, work week, or starting time of any shift, or to implement the traditional schedule (article IV) or any alternative schedule adopted, on 30 days' notice.
	Appendix C (Part 4)	If the workforce is reduced below the base level of employment set out in Part 1 Appendix C, the weekend/holiday schedule must be abolished and further scheduling at the mine or facility shall then be governed by terms and conditions of article IV.
	Appendix C (Part 7)	Changing crews at the face — at operations with alternative schedules, notwithstanding the provision to the contrary regarding the elimination of mandatory overtime, the employer has right to change crews at the face including the right to require reasonable amounts of overtime to allow this to occur. However, in no event will an employee working on a Saturday, Sunday or holiday under the weekend/holiday schedule be required to work beyond regular scheduled 12 hour shift.
	Appendix C (Part 8)	Overtime work — where employees are working on alternative schedules, overtime work will be offered on an as needed basis. An overtime roster must be kept up to date and posted in each operation for the purpose of distributing overtime on an equitable basis to the extent practicable.
	Appendix C (Part 9)	Idle day work — for employees on alternative work schedules, idle day work to be scheduled on an as needed basis and equitably.

Type of arrangement	*Article*	*Agreement provision*
Roster arrangements		See above.
Paid breaks		See shift arrangements.
Annual leave	*XIII(a)*	14 consecutive days to be taken in 3 separate regular vacation periods except in 1998 where there will be 2 periods. No regular or staggered vacation during 1993 among workers returning from strike; instead they are to receive pay in lieu for all days of vacation accrued as of 31 May but not taken in 1993.
	XIII(b)	Dates set down for regular vacation periods each year of the agreement.
	XIII(c)	Employer may, irrespective of past practice to the contrary, operate the mine without interruption and schedule regular vacations of 14 days for each employee during the calendar year. In this event, employer must file a written declaration with the respective district president of the UMWA by January 1 of relevant year. Times of vacation to be at times desired by individual employee so long as this does not interfere with the efficient operation of the mine and so long as not more than 15 per cent of the work force at a mine elects to be off on the same day. Should there be a conflicting choice of vacation between 2 or more employees, the choice will be determined on seniority basis.
	XIII(e)	For calendar years 1993 to 1997, each employee with one year of continuous employment with employer is entitled to 4 additional days of (floating) paid vacation. If employer has a Christmas shutdown period, specified number of floating vacation days to be used each period, otherwise employee to give 30 days' notice of taking floating vacation days at some time during the calendar year in which they are due. Unused floating vacation days to be paid in lieu (paid at regular rate plus overtime) or may carry over no more than 4 floating vacation days into the next calendar year. Any days carried over can only be used for leave pursuant to the *Family and Medical Leave Act 1993* (or receive pay in lieu at the end of the calendar year). No employee can accumulate more than 8 floating vacation days in any calendar year.
	XIV	Additional (graduated) vacation days per year corresponding to length of continuous employment with the employer — commencing at one additional day per year for employees with over 6 years up to 7 years of continuous employment increasing to a maximum of 13 additional days for employees with 18 years or more of continuous employment. Strict definition of continuous employment but is not broken by lay-off, transfer from one mine to another for the same employer or by sale, lease, sub-lease or assignment to successor company. Employee forced to cease work because of injury or illness to be paid out full amount of unused graduated vacation time for calendar year he ceases work as well as for year he returns to work.

Type of arrangement	*Article*	*Agreement provision*
	Appendix C (Part 6)	Employees working on alternative schedules have option to schedule off for staggered regular vacation, floating vacation days or graduated vacation days provided that this does not interfere with efficient operations and so long as not more than 15 per cent of the workforce on the weekend/holiday crew or the modified weekday crew at an operation elects to be off on the same day.
Long service leave		No provision.
Sick leave	*IX(e)*	5 days per year during the calendar years 1993 to 1997 (eligible after serving one year or more of classified service). For calendar year 1993, each employee who returns to work from a strike as scheduled following ratification of the agreement may take a maximum of 2 days of personal or sick leave for the remainder of the calendar year. Entitlement of 3 days personal or sick leave for calendar year 1998. Sick leave not to be utilised for period less than one full regular working day. Employee to notify at least 24 hours in advance or at least 2 hours in advance in the case of sudden sickness, accident or emergency. Unused sick days can be paid in lieu thereof or carried over to next calendar year. No employee can accumulate more than 10 personal or sick leave days in any calendar year.
Parental leave	*IX(f)*	Family and medical leave — 12 weeks' unpaid leave of absence for (i) birth of child, (ii) placement of child for adoption or foster care, (iii) care for family member with serious health condition or (iv) serious health condition of employee (under provisions of *Family and Medical Leave Act 1993*). During period of absence, employee to continue to accrue seniority, vacation, pension and all other employment benefits provided by agreement. Health and dental care shall continue during leave of absence. Where employee is using family and medical leave for reasons (i) and (ii) above, employee is to first substitute accrued vacation and personal leave. Where employee is using family and medical leave for reasons (iii) and (iv) above, employee is to first substitute accrued vacation, personal and sick leave. All such paid leave to count towards unpaid 12 week entitlement.
Other leave	*IV(d)* *IX(a)* *IX(b&d)* *XII*	No coal to be produced or processed on Christmas Eve and Christmas Day holidays. Paid bereavement leave (3 days — 2 to be consecutive and include the day of the funeral). Time off for jury and military duty. Public holidays — 11 specified paid holidays during first to fourth years of agreement, 6 specified paid holidays during fifth year of agreement. If any holidays fall on a Sunday (except the employee's birthday holiday), then it shall be taken on a Monday. If any holidays (except the birthday holiday) fall on a Monday then work on a preceding Saturday is optional (except for employees covered by article III(o)(10)).

Type of arrangement	*Article*	*Agreement provision*
	XVII(l)	Employees may be granted leave of absence (not to exceed 4 consecutive months) to participate in union activities and to serve as district or international officers or representatives. They shall retain their seniority and continue to accrue seniority while on such leave. Except in certain circumstances, no more than 2 employees may accept temporary union assignment from the same mine at the same time. Entitlement to return to former job and shift.
Remuneration and on-costs		
Base pay	*IV(e)*	Appendix A, standard daily wage rates for work performed according to job titles; Appendix B, Part I, five grades for underground jobs in deep mines; Appendix B Part II, five grades for jobs in strip and auger mines; and Appendix B, Part III, four grades for jobs in preparation plants and other surface facilities for deep or surface mines. Employers cannot introduce any job title or classification that is not in the agreement. If employee thinks they are inappropriately classified, they may file grievance (see article XXIII).
	X	Wage increases: wage increase of 50 cents per hour upon ratification of agreement, 40 cents per hour on first and second anniversary of agreement. Employees who were not on strike during period from 1 February 1993 to date of ratification of agreement to be paid retrospectively the 50 cents per hour increase. Employees who were on strike and returned to work as scheduled to be paid a one time lump sum ratification bonus of $500 in addition to health care bonuses (see Article XX). Employees cannot receive both retrospective wage increase and the bonus.
	IX(c)	Reporting pay — employees who report for work at the usual time (unless notified not to report) to be paid for 4 hours whether or not the operation works the full 4 hours. After the first 4 hours, hours worked to be paid by the hour or fraction thereof. If regular routine work cannot be furnished, employer may assign the employee to other than regular work.
	XVIII	Tonnage rates and hand loading — (a) hand loaders employed on a tonnage rate basis to have rates negotiated between employer and union; (b) where wages are based on weights, employee has the right to a checkweighman of their own choosing to inspect the weighing of coal or to check the accuracy and fairness of other methods of payment. Wages of checkweighman deducted from earnings of employees on an agreed percentage basis; (c) explicit rejection of certain ‘reject’ clauses in district agreements relating to preparation and cleaning of coal; (d) delivery of cars by pushing to be settled by local negotiation; (e) matters affecting the cost of explosives referred to the district conferences; (f) all bottom coal to be taken up and loaded by employee; (g) cutter shall cut coal as directed by the employer; (h) no charge for blacksmithing; (i) rock-dusting to be done at expense of employer; (j) when day men are

Type of arrangement	*Article*	*Agreement provision*
		transferred to loading coal, the individual affected (if aggrieved) shall have the right of review under the settlement of dispute procedure in agreement.
	XXA	Dental plan — provides dental benefits for employees and their eligible dependants at a cost to each employee of $2 per month payable on a payroll deduction basis. Details of plan provided in article.
	XXII	Tramming — machine operator's rate or helper's rate (where applicable) to be paid for the tramming of mobile loading, cutting, continuous mining or related machines and equipment from one location to another.
	Appendix C (Part 5)	Provisions establishing definition of straight time rate/shifts for employees working alternative schedules.
	Appendix C (Part 10)	Reporting pay — among employees on alternative schedules, for reporting pay purposes, employees on the modified weekday crew will be paid 5 hours at the straight time rate, employees on the weekend/holiday crew will be paid 5 hours at the straight time rate for work on Friday or Monday, and 10 hours at the straight time rate for work on Saturday, Sunday and holidays.
Overtime pay	*IV(b)*	Inside, outside and outside continuous employees — overtime hours paid for at time and a half, except as provided in IV(d), with no pyramiding of overtime.
	VI(e)	Employees who have completed regular shift and left premises and are called out on another shift within 24 hour period of regular shift to be paid the applicable premium rate together with any shift differential for the hours worked on the additional shift.
	VI(f)	Time and a half not to be paid whether the regular rotation of shifts requires the working of more than one shift in any consecutive 24 hour period.
Shift pay	*V(c)*	Afternoon shift: all employees, whether paid by the day or by the ton, paid 30 cents additional for each hour worked. Midnight shift: all employees, whether paid by the day or by the ton, paid 40 cents additional for each hour worked. Such shift differentials to be considered part of regular rate of pay in calculation of overtime, premium rates, holiday, vacation, reporting, jury duty, military duty, bereavement pay and personal or sick leave.
	VI(c)	Employees who complete regular shift and continue work into the next shift shall be paid at the applicable differential for all additional hours worked.
Weekend pay	*IV(d)*	Saturday work to be paid at time and a half, except overtime on a Saturday which is paid at double time. Sunday work to be paid at double time.

Type of arrangement	*Article*	*Agreement provision*
Annual leave pay	*XIII(d)*	Employees to receive the sum of 12 times the day wage rate (including any regularly scheduled overtime) plus shift differentials where appropriate (formula specified).
	XIV(f)	Graduated vacation pay based on regular standard daily wage rate including any regularly scheduled overtime at the time vacation payment is due and to include any applicable shift differential.
Bonus pay	*XXII(s)*	Bonus plans — provisions providing: (1) procedures for installation; (2) conditions; and (3) resolution of disputes.
Sick pay	*IX(e)*	Sick pay paid at regular rate (including regularly scheduled overtime where applicable but not including premiums for Saturday, Sunday, holidays or birthday work).
Accident pay	*XI*	Sickness and Accident Benefits Plan — an insurance scheme designed to protect employees against financial hardship resulting from sickness or accident suffered on or off the job by providing compensation for lost earnings. Detailed provisions relating to eligibility of benefits, filing of claims, structure and administration (employer responsible either directly via self insurance or indirectly through insurance carrier) etc. Benefits for disability resulting from accident, either on or off the job, shall be payable for a maximum of 42 weeks regardless of the length of employee's classified employment with employer at the time of the accident. Benefits for disability resulting from sickness are payable according to the following schedule: *Length of employment at date of disability* — *Max number of weeks* 6 months to less than 1 year — 6 1 year to less than 5 years — 13 5 years to less than 10 years — 26 10 years but less than 15 years — 39 15 years or more — 52 The amount of benefits to be: $230 per week during the first year of agreement; $240 per week during second year of agreement; and $250 per week during third to fifth years of agreement.
Severance and retrenchment pay		No provision.
Special rates and allowances		No provision.

Type of arrangement	*Article*	*Agreement provision*
Public holidays	*IV(d), XII(d&e)*	Any work on a specified holiday, paid for at triple time. Pay for holidays not worked paid for at regular pay (including regularly scheduled overtime provided employee was not absent on last scheduled day prior to or first scheduled day following the holiday).
	XII(f)	When holiday (other than birthday holiday) occurs during scheduled vacation, employee to be paid for holiday not worked in addition to vacation pay and to designate another day he wishes to take as a holiday.
	XII(g)	Birthday holiday — employee whose birthday occurs during scheduled work period can elect to take day off as birthday holiday and receive regular pay (including overtime) or to work and receive triple time for all time worked. If birthday falls during non-scheduled work period or on another public holiday, employee can designate another day as the birthday holiday (within 10 days of actual birthday) to be either taken off or worked and paid as above.
Working clothes and safety boots	*III(m)*	Safety equipment and devices, including electric cap lamps, self-rescuers, personal ear plugs, prescription safety glasses exclusive of eye examination costs, non-prescription safety glass or goggles, and knee pads to be provided by employer without charge. Employee expected to provide own personal wearing apparel such as clothing, shoes, boots where worn as part of normal footwear, hats, belts, and gloves. However, employer is to provide employee with annual protective clothing allowance ($190 in 1993, $200 in 1994 and $210 in each year 1995 to 1997). New employees entitled to allowance on first payday following employment.
Travel	*II(F)*	When employees are undertaking training under the UMWA-Employer Skills Training Program, and travel away from the workplace or overnight stay is required, the employer and the local union to meet and establish the amount and manner in which expenses are to be provided for lodging and travel.
Training costs	*II(E)*	UMWA-BCOA Training and Education Fund: employer to contribute 8 cents per employee per hour actually worked in the first two years of the agreement and 9 cents per employee per hour in the third and subsequent years of the life of the agreement.
	II(F)	While employees are undertaking the UMWA-Employer Skills Training Program, employees are paid at their regular straight time classified rate for all time spent in skills training (except where overtime rate is required by statute).
Other on-costs	*III(l)*	Employers who are party to the agreement must provide employees with the protection and coverage of the benefits under workers' compensation and occupational disease laws, whether compulsory or elective, in the relevant State.

Type of arrangement	*Article*	*Agreement provision*
	IX(a)	Pay while on bereavement leave to include regular and overtime pay.
	IX(b)	Jury duty — employer to reimburse difference between normal pay (including overtime or premium time) while on jury service and jury fees received.
	IX(d)	Military duty — upon proof of service, employee entitled to 2 weeks' pay at regular rate (including any regularly scheduled overtime or premium pay) less any amounts received by employee for such duty.
	XX	Health and retirement benefits — general purpose of the plans is to provide health care for working and retired miners and their dependants; pensions for miners upon their retirement; health care and financial support for eligible disabled miners; and financial support for surviving spouses and surviving dependants provided by each of the trusts and plans set out in the article. Each signatory employer must contribute to nominated trusts amounts specified based on cents per hours worked by each of the employer's employees who perform classified work under the agreement. Trusts administered by trustees who have their responsibilities and duties described. Audit, report and notice procedures, administration of trusts, and employer's guarantee of 1950 and 1974 plans and trusts also specified. A general description of several trusts and plans is also provided in the article.
	XXB	UMWA cash-deferred savings plan of 1988 — maintenance of pension plan and trust for employees separate from those in article XX. To provide additional retirement income to employees and their dependants funded by voluntary wage deferrals and, as necessary, employer contributions to pay the cost of administration.
	XXII(n)	Lunches — employees working 2 or more hours in addition to own regular shift or who are called back to work after leaving premises to be provided with lunch at employer's expense.
Functions, tasks and skills		
Functions	*IA(c)*	Supervisors not allowed to perform classified work, except where training classified employees.
	IA(e)	Union representatives allowed reasonable opportunity to campaign during non-working hours in non-working areas, provided there is no interference with production.
	III(d)	Mine Health and Safety Committee (MHSC) to be established and comprise miners employed at the mine and selected by the local union. Members of the MHSC shall participate in and will be paid at their regular rates of pay by the employer for attendance at training sessions.
	XVII(b)	When the number of employees within a job title is to be reduced or employees are to be realigned, detailed specification of seniority procedure for order of retaining and/or moving of people to different functions, job grades and shifts.

Type of arrangement	*Article*	*Agreement provision*
	XVII(m)	Employees who are promoted to a permanent supervisory position not covered by the agreement to forfeit their original seniority and panel rights. Employees may perform such supervisory work on temporary basis not to exceed 60 working days (cumulative) during any contract year without loss of seniority.
	XXI(b)	Duties of oiler, groundman and drill helper specified.
Job and task demarcation	*XIX*	Classification — an employee shall normally be assigned to duties customarily involved with his regular classified job. Every reasonable effort shall be made to keep an employee at work on the job duties normally and customarily a part of his regular job and to minimise the extent of temporary assignments.
	XXI(e)	Repairs on electrical components or circuits supplying power to any device or equipment located at a surface mine shall be done by qualified UMWA electricians.
Training	*II(E)*	Establishment of UMWA-BCOA Training and Education Fund to provide financial assistance for training or education to unemployed UMWA miners and/or their family dependants and/or the family dependants of active classified employees in coal-related industries who are seeking employment in the coal industry, in coal-related industries or in any other vocation, trade or employment of the applicant's choosing.
	II(F)	Establishment of UMWA-Employer Skills Training Program — where new technology or improvements to existing technology is introduced, employer is to provide relevant employees with skills training necessary for the safe and efficient operation of the machine or equipment introduced.
	III(d)	Occupational health and safety training program to be established by the Joint Industry Training Committee.
	XVI	Joint Industry Training Committee to be established, with 3 representatives appointed by UMWA and 3 representatives of industry, appointed by the BCOA. Committee to focus on fostering and promoting the advancement of effective training in the industry, with special attention given to the problems of employers operating 3 or fewer mines and aid in devising training programs for these companies that will permit them to institute effective training programs without imposing undue hardships. Detailed specification of training relating to: orientation for new employees; general retraining programs (every classified employee participating at least once during the calendar years 1993 to 1998); safety training for specific job; maintenance training; new inexperienced employees at underground mines; and skill enhancement program. General training provisions include that any training program to be conducted in accordance with the following: (1) emphasis on health and safety in addition to

Type of arrangement	*Article*	*Agreement provision*
		job requirements; (2) union has opportunity to review each training program and make comments and suggestions; (3) selection of employees for training in accordance with seniority and trainability (definition spelled out of the latter); and (4) management to make periodic evaluation of employee's progress or lack thereof while in training.
Qualifications		No provision.
Procedural arrangements		
General	*IA(d)*	Direction of the workforce is vested exclusively with the employer.
	II(D–3)	Employers to provide monitor (established by UMWA-BCOA Labour Management Policy Committee) with regular reports of all jobs filled pursuant to the job opportunity provisions.
	II(E)	Employer to provide monthly statement on a mine-by-mine basis, the full amounts due and the hours worked with respect to the amounts payable to the UMWA-BCOA Training and Education Fund.
	II(H)	Establishment of UMWA-BCOA Labor Management Policy Committee to identify problems affecting the industry (such as legislation, the environment, technological changes etc), formulate plans to solve those problems and, where appropriate, conduct joint activities designed to implement the plans. Based on premise that mutual cooperation at the highest level is required for industry to maintain and enhance its competitive position. Committee to comprise 4 high level representatives of the UMWA, 4 high level representatives designated by BCOA and one neutral Chairman selected by other members of the Committee.
	VII	Establishes Mine Communication Committees (MCC) at each mine. Top level international union and employer representatives to tour mines to promote improved relationships and introduce concept of MMC. Union membership to include local union President, Mine Committee Chairman and Safety Committee Chairman. To meet no less than once a month with the main function being to identify and discuss any problems or potential problems which, if unresolved, could interrupt the steady and regular operation of the mine and, from time to time, discuss areas of special concern.
	XV	Employer to 'check-off' union dues and fees as well as other nominated areas (eg., credit union, union-sponsored group auto insurance etc) from the wages of employee and to remit to union for distribution to its branches as appropriate. Employer also to submit to the union an itemised statement showing name, social security number, hours worked, amount checked off for dues, initiation fees and assessments etc for check-off of employees (plus a list of employees among whom such financial information has not been collected). In order to comply with *Labor-Management Relations Act 1947*, union must obtain employee's written authorisation and provide this to employer.

Type of arrangement	*Article*	*Agreement provision*
	XXI(c)	Employer to provide centrally located eating place at each major pit which the employer shall keep clean and adequately heated and ventilated to ensure comfortable conditions in all seasons. Cabs of the machine or vehicle may be used as an eating place.
	XXI(f)	Employer to provide sanitary ventilated toilets and be responsible for keeping them clean.
	XXII	Miscellaneous — provisions relating to (a) bath house facilities; (b) access roads; (c) parking facilities; (d) bulletin boards; (e) proper rules negotiated between employer and district president of union to provide for continuous operation of coking and cleaning plants; (g) house coal to be sold to employees (including ex-employees and their widows) who live within a reasonable distance of the mine, for domestic use at cost of production less sales and administration costs; (h) equitable adjustment of house rents subject to union approval; (i) attendance control program (specified policies and procedures and steps to deal with employee absence in prescribed circumstances); (j) memorial periods — UMWA may designate periods not exceeding 10 days during the term of the agreement; (k) work to cease at any mine on any shift during which a fatal accident occurs and mine to remain closed on all succeeding shifts until starting time of next regularly scheduled work of the shift on which the fatality occurred; (l) new machinery — right to install and operate new types of equipment is recognised, procedures set down to give notice to union of new equipment, for parties to agree on the job classification of operator and establish manning requirements for the new equipment. While agreement is being reached, equipment to operate with requirements established by employer but employees have right to file grievance on manning and classification under article XXIII. If the employees prevail, arbitrator to grant retrospective relief with respect to classifications; (o) portals — employer has the right to establish and move portals if adequate facilities, conveniences and safety are furnished to the employees, subject to right of review of union; (p) tools — to be furnished by employer; and (r) union able to use bath house as a meeting place provided no interference with production or intended use of facilities.
	XXV	Neither employer nor union to discriminate against any employee.
	XXVI	All prior practice and custom not in conflict with this agreement shall be continued.
Dispute settlement	*XXIII*	Settlement of disputes — provisions relating to: (a) establishment of Mine Committee (MC) – to consist of at least 3 but not more than 5 employees elected by employees (and at least 1 member of the MC on each shift as far as practicable) with main duties being the adjustment of disputes arising from agreement that the management and employee have not resolved; (b) establishment of District Arbitrators — either: (1) presidents of UMWA International Union and BCOA to jointly establish a panel of impartial arbitrators for each UMWA district with each panel to serve for 18 months or (2) employer and UMWA district may choose to select a district arbitrator or

Type of arrangement	*Article*	*Agreement provision*
		panel of district arbitrators with term agreed upon by appointing parties. If no agreement reached within 90 days of agreement then selection procedure (1) to apply; (c) Grievance Procedure — resolved in steps (1) employee to make complaint to immediate foreman who has authority to settle matter. Foreman to notify employee of decision within 24 hours; (2) if no agreement reached between employee and foreman, complaint submitted on BCOA-UMWA Standard Grievance Form and taken up within 5 working days by MC and management. If complaint not settled, grievance referred to representative of the UMWA district and representative of employer; (3) within 7 working days, district and employer representative to meet and review facts in effort to reach agreement. Members of the MC have the right to be present. No verbatim transcript of testimony shall be taken. Neither district nor employer representative to have participated in steps (1) and (2) above; (4) in cases where agreement is not reached in (3) then within 10 calendar days after referral to them, they refer matter to appropriate district arbitrator who shall decide the case without delay. Cases assigned to arbitrators in rotation. Cases to be heard no later than 15 days after referral to arbitrator. To expedite grievances, arbitrator can hear more than one grievance against same employer on the same day; (d) 10 day limitation — grievances not filed within this period denied and not processed further; (e) earnest effort to resolve disputes — effort to resolve disputes in open manner and as quickly as possible; (f) employee has right of presence of member of MC present to assist him with any discussion with his foreman during step (2) above (except where it will interfere with production). In this case, foreman may have another representative of employer in attendance; (g) right of grievant to be present during all steps of grievance procedure; (h) settlements reached at any stage of procedure to be final and binding on both parties and not subject to further proceedings except by mutual agreement. Settlements reached in steps 2 and 3 to be in writing and signed by appropriate representatives of union and employer; (i) legal counsel is excluded in steps 1 to 4 except by mutual agreement; (j) time limits can be waived by mutual agreement; (k) grievances arising from previous agreement to be resolved in process established by previous agreement.
Agreement making	*XXVI(b,c & d)*	Any provisions in any district or local agreements providing for the levying, assessing or collection of fines or providing ‘no strike’, ‘indemnity’ or ‘guarantee’ clauses or provisions are expressly repealed and shall not be applicable during the term of this agreement. Where this agreement conflicts with any district or local agreement, this agreement shall prevail. Within 6 months following date of signing of this agreement, copies of all district agreements to be provided to International Union and BCOA. All provisions of any contracts or agreements between parties providing for a protective wage clause and a modification of this agreement if a more favourable wage agreement is entered into by the UMWA are made null and void. No district agreement negotiated hereunder to

Type of arrangement	*Article*	*Agreement provision*
		become effective until approval of such contract or agreement by the International Union of UMWA has been obtained first.
Negotiating change	*IA(e)*	Right of entry to authorised representatives of union to ensure compliance with agreement.
	II(G)	UMWA-BCOA Labor Management Positive Change Process (LMPCP)— designed to discard old ways of negotiating in an atmosphere of mistrust and to foster a new environment of mutual trust and facilitate new and creative approaches to labor-management relations through increasing the involvement of employees in the success of the mine. Establishes LMPCP Committees at nominated facilities (made up of 3 members of the Mine Communication Committee and 3 local management representatives, one of whom must be the Superintendent). Employee members of this committee to be compensated by the employer for time spent in meetings at relevant straight time rate. Establishes LMPCP Fund to promote LMPCP Programs at nominated facilities and to pay the expenses of the Chairman of the Labor-Management Policy Committee. Each employer to contribute to LMPCP Fund 3 cents per employee per hour actually worked. Employer's obligations to pay suspended when assets of the Fund equal or exceed $1.3 million and shall not resume until the assets are less than $500 000. Duty of each employer to furnish the UMWA and the Trustees of the Fund a monthly statement showing on a mine-by-mine basis the full amounts due and the hours actually worked with respect to the amounts payable. Amount of grant to nominated facility not to exceed $20 000 per year (for specified uses).
	Appendix C	Provision to introduce alternative schedules in order to provide continuous operations 7 days a week provided the overall employment level at the operation is increased and mandatory overtime is eliminated. Obligation to increase employment levels is subject to an exception for conditions beyond the control of the employer.
Redundancy	*XVII(c)*	Lay-off procedure— management to meet with the Mine Committee at least 24 hours in advance of reduction or realignment and review the available jobs and the individuals to be laid off, retained or realigned. Standard form to be completed by laid-off employee within 5 days of notification and distributed to union within 7 calendar days.
	XXIV(b&c)	Discharge procedure — when management decides to discharge an employee, employee is to be suspended with intent to discharge and to be given written notice stating reason, with copy to MC. After 24 hours but within 48 hours, employee has the right to meet with the mine superintendent or manager. At such meeting, MC or MC representative to be present, and, if requested by employee or MC, a representative of a UMWA district representative also to be present. If requested by district representative, a further 48 hour time limit to be given. Employer entitled to have an equal number of representatives at meeting. If employer informs employee at the meeting that he still intends to discharge, employee remains suspended for a period of time necessary to permit

Type of arrangement	*Article*	*Agreement provision*
		employee to file a grievance and have it arbitrated. If no grievance filed within 5 days of notice of suspension with intent to discharge, the discharge is effective immediately; (d) immediate arbitration if district representative does not believe just cause for discharge exists; (e) regular arbitration — where there is no request for immediate arbitration the employee shall be discharged and case to be processed in accordance with article XXIII; (f) compensation for lost earnings for employee in cases where just cause for discharge is not established.
Payment of wages	*XXII(m)*	Employees paid at least every 2 weeks. Payment by cash or cheque. Discounting of earnings through scrip or tokens prohibited. Employee to receive with pay a statement detailing hours worked and payroll deductions.
Work models		No provision.
Safety management	*III(b)*	Parties to the Agreement abide by the *Federal Mine Safety and Health Act of 1977, As Amended.*
	III(c)	Establishment of Joint Industry Health and Safety Committee — 3 members appointed by the Union, 3 to be appointed by the Employers. At least one of each group to have special knowledge and expertise in coal mine health matters.
	III(d)	Establishment of Mine Health and Safety Committee (MHSC) — comprised of miners employed at each mine and selected by the local union. Union and employer to jointly establish and fund a course of health and safety training for members of the MHSC. MSHC may inspect any portion of the mine and surface installations, dams or waste impoundment and gob piles. Any conditions which endanger lives or bodies of employees to be reported to employer. Employer is obliged to follow MHSC's instructions if the Committee believes imminent danger exists. Sufficient notice to be given of inspection to allow employer representative to accompany. If employer chooses not to participate, Committee may make inspection alone. Procedures established in cases where employer requests removal of one or all Committee members (disputes decided by arbitration). MHSC to meet monthly and employer responsible for paying Committee members for (i) inspecting the mine and surface installations on a regular basis but not less often than every 2 months (in which case the member is paid one shift at regular rate of pay for each inspection); (ii) regular committee meetings up to 2 hours (at regular rate of pay); and (iii) investigating explosions and/or disasters including any mine fatality.
	III(e)	Union officials granted access to mine under prescribed conditions.
	III(f)	MHSC and employer to maintain records concerning inspections, findings, recommendations and actions. Each month, employer is to provide MHSC with two copies of a list of all accidents reported to MSHA.

Type of arrangement	*Article*	*Agreement provision*
	III(g)	Reasonable rules and regulations established by the employer (and not inconsistent with Federal and State laws) to be complied with. Any changes to such rules and regulations to be discussed with MHSC. Any dispute to go through grievance process.
	III(h)	MHSC to be given opportunity to submit comments or recommendations (pertaining to health and safety) on development, modification or revision of mining plans.
	III(i)	If an employee believes, in good faith, that he is working in abnormally or immediately dangerous conditions, he must notify supervisor immediately. Unless there is a dispute between employee and management as to the condition, steps should be taken immediately to correct or prevent exposure to condition. If dispute exists, employee has the right to be relieved from duty. Another employee assigned to relieve is to be paid at the higher of the rate of the job to which he/she is assigned or relieved. If MHSC member or members and management agree that condition does not exist, employee is to return to regular job immediately. If dispute remains unsettled, then appropriate Federal or State inspection agency to be called immediately and dispute settled on the basis of the findings of the inspector. If corrective action required, employer to do so immediately.
	III(n)	Maintenance program to be established at each mine to ensure that equipment is maintained in a safe operating condition.
	III(o)	Procedures established for Special Safety Problem Areas.
	III(p)	Procedures established for Settlement of Health or Safety Disputes. Any grievance which is not filed within 24 hours following the shift on which the grievance occurred shall be invalid.
	XXI(e)	Detailed provisions relating to equipment on machinery etc.

a Agreement between the United Mine Workers of America (UMWA) and the Black Coal Operators' Association (BCOA) and companies that are signatories. All employees working in or about the mine are included in the Agreement except essential supervisors (for example, mine foremen, assistant mine foremen who have inspection duties by law and supervisors who perform no production work).

Source: *National Bituminous Coal Wage Agreement of 1993.*

J STATUTORY POSITIONS

J.1 Statutory positions in black coal mines

The coal industry legislation in both NSW and Queensland includes a requirement to appoint people with particular qualifications to undertake certain functions at each mine.

Tables J.1, J.2 and J.3 provide a detailed list of these statutory positions and their associated functions and qualifications for NSW coal mines, and an indicative list for Queensland coal mines. The tables indicate that the legislation:

- heavily influences the site management structure for each open cut and underground mine (although underground mines are more affected than open cut mines because of the greater number of positions that are compulsory in underground mines);
- strongly affects the number of staff required at each level on site by setting out the functions to be undertaken by each position; and
- influences the nature of management at each mine by setting out the qualifications, training and experience required for each position, as well as the functions to be undertaken by the person filling each position.

J.2 Statutory positions in other (non-coal) mines in New South Wales and Queensland

Fewer statutory positions are required at NSW non-coal mines than at NSW coal mines. There are four Acts relating to non-coal mining in NSW:

- the *Mining Act 1992*;
- the *Mining Legislation Amendment Act 1996*;
- the *Mines Inspection Act 1901*; and
- the *Mines Rescue Act 1994*.

The *Mines Inspection Act 1901* (NSW) (MIA) (which applies to all mines other than mines of coal and shale) sets out 3 statutory positions for non-coal mines in NSW. Tables J.4 and J.5 summarise these appointments and associated certification requirements. It is interesting to note that, in contrast to the coal

legislation, the main function of management as prescribed in the MIA does not emphasise enforcement of compliance with the Act.

Similarly, for non-coal mines in Queensland, the regulations relating to statutory positions (the *Mines Regulation Act 1964* (Qld) covering all mines except coal mines) are less prescriptive than for Queensland coal mines. Managers and assistant managers are the only statutory positions specified by the Act. (Assistant managers are not compulsory.) While winding engines are to be in charge of a licensed person, and surveying is to be undertaken by an authorised surveyor or certificated mine surveyor, these are not specified as compulsory statutory positions (see Table J.6).

J.3 Union involvement in the legislation

Tables J.7 and J.8 show the legislative provisions allocating safety-related responsibilities to union appointees.

Table J.1: **NSW coal mining statutory positions**

Statutory position	*compulsory /optional*	*Qualifications specified in regulations*	*Functions (summary)*
A Government officials			
Departmental Inspectors (various, including Chief Inspector)	optional (Governor may appoint under the Public Service Act)	(**See Table J2** for description of all acronyms in this column) Must hold qualifications prescribed in relation to position. Qualifications for Chief Inspector, Deputy Chief Inspector or Senior Inspector: CCM and not less than 3 years' experience as an inspector; or not less than 3 years' experience as a manager of an underground mine.	Power to enter and inspect mine at any time to ascertain whether Act is complied with, whether mine is safe or reasons for accident. May impose prohibition/restriction on unsafe activities or direct evacuation or closure of mine
B Mining officials			
B.1 Underground and open cut — officials in order of seniority as listed in Schedule 1 of the Coal Mines R egulation Act 1982 No 67			
Superintendent	optional	CCM/CCMOC	Represents owner.
Assistant Superintendent	optional	CCM/CCMOC	
Manager	compulsory	CCM/CCMOC	In charge of all persons employed and all mine operations and enforce compliance with the Act and regulations.
Deputy Manager	optional	CCM/CCMOC	Assumes manager's functions when Manager absent.

Statutory position	*compulsory /optional*	*Qualifications specified in regulations*	*Functions (summary)*
B.2 Underground and open cut — other officials — order of seniority not specified in Schedule 1, CMRA 1982			
Mine Surveyor	compulsory	Registration as a surveyor under the Surveyor's Act 1929 and CCMS.	Comply with surveying and drafting instructions issued by Chief Inspector and Surveyor General; comply with the Act (including in preparing mine plans); carry out surveying work as requested by mine manager; draw attention to inaccuracies in mine plans and keep maps and records.
Mine Electrical engineer	compulsory	CCMEE	Supervise all persons supervising or effecting installation, examination, maintenance of all electrical apparatus at the mine.
Mine Mechanical Engineer	compulsory	For underground or open cut, CCMME or, for open cut, if have approval from chief inspector: can appoint person who has acted in the position for 2 years; or who holds a degree or diploma in mechanical engineering and has 1 year's experience in open cut.	In charge of all persons installing, examining, or maintaining mechanical apparatus.
Electrician	optional	(1) CCMEE or (2) 18 months' experience in the job; or (3) 3 months' experience in the job and an: (i) electrician's licence from Energy Authority of NSW; (ii) electrical trades certificate from NSW TAFE; (iii) electrical engineering certificate from NSW TAFE; (iv) electrical engineering qualification accepted by Institute of Engineers.	

Statutory position	*compulsory /optional*	*Qualifications specified in regulations*	*Functions (summary)*
Plant Manager of Coal Preparation Plant	not specified	Not specified.	In charge of all persons employed and all mine operations and enforce compliance with the Act.
District Check Inspector, Check Inspector, Electrical Check Inspector	optional	District Check Inspector (DCI) must have CCD. Check Inspector: For underground mine, at least one of two people elected must hold CCD and both must have no less than 3 years' practical experience in underground mining; or, where mine is open cut mine, elected person must have not less than 3 years' practical experience in open cut coal mining.	Miners elected to carry out mine inspections on behalf of employees and make reports to management of findings. Where authorised by Chief Inspector, DCI has power to suspend mine operations. DCI to be elected by employees who are members of the Australian Coal and Shale Employees Federation (ACSEF). (The ACSEF is now part of the CFMEU.) Election of check inspectors to be conducted by persons elected by a committee consisting of a representative from each union with members employed at the mine.
Shotfirer	compulsory	CCD/CCE or SP medical test.	Fire explosives.
Fire Officer	compulsory	Instruction in appropriate practices used by the Board of Fire Commissioners of NSW; familiar with workings of mine.	Inspect fire equipment and record condition; arrange for repair and maintenance required under regulation; investigate complaints about fire equipment; replace defective equipment; train fire brigades.
First Aid Officers	compulsory	Recognised first aid qualification.	In charge of first aid room.
Airborne Dust Sample Collector	compulsory	No.	Collect and analyse dust samples.

Statutory position	*compulsory /optional*	*Qualifications specified in regulations*	*Functions (summary)*
B.3 Underground mines — officials in order of seniority specified in Schedule 1, CMRA 1982			
Under-Manager In Charge	compulsory when Manager is appointed Manager of two mines	CCUM	Assumes Manager's functions when Manager and Deputy Manager absent; enforce compliance with the Act and regulations in part of mine over which he has jurisdiction.
Under-Manager (UM)	optional (although cannot work mine without someone qualified as an UM)	CCUM	Assumes Manager's functions when Under-manager-in-charge absent; enforce compliance with the Act and regulations in part of mine over which he has jurisdiction.
Deputy (various types — eg. Production, Outbye, Shaft Sinking)	compulsory	CCD	(First line supervisor/safety officer) In charge of workers and operations in the part of the mine assigned to him; make inspections, ensure unsafe equipment is not used, complete safety report at the end of each shift. In relation to inspections, for example, s.64 of the *Coal Mines Regulation (Managers and Officials-Underground Mines) Regulation 1984* (NSW) specifies that:

Statutory Position	*compulsory /optional*	*Qualifications specified in regulations*	*Functions (summary)*
			(6) The Manager of a mine shall, in respect of every deputy's district (production) in which persons are working, appoint a deputy to inspect: (a) at intervals not exceeding 2 hours-every place in which a continuous mining machine is operating; (b) at intervals not exceeding 4 hours: (i) every place in which persons are working and where the roof and sides are being removed, supported or interfered with; (ii) every working face and safely accessible roadway within 100 metres of any working face; and (c) at intervals not exceeding the duration of a shift — every place or roadway (including all return airways in that district) which have not been inspected pursuant to paragraph (a) or (b).
B.4 Underground mines — other officials not specified in order of seniority in Schedule 1 CMRA 1982			
Ventilation Officer	compulsory	CCUM	Oversee ventilation system and write monthly reports.
Rope Haulage/ Winding Apparatus Operator	compulsory[a]	No.	Work machinery used for transporting persons by winding or rope haulage.
Banksman and Onsetters	compulsory[b]	No.	Where winding apparatus not remotely controlled, banksman (at top of shaft) and onsetter (at bottom of shaft) to receive signals and transmit signals whenever person about to travel through shaft.
Master Sinker	compulsory	Experienced in shaft sinking.	Full charge and control of shaft sinking.
Chargeman	compulsory[c]	CCD	A deputy appointed in charge of the shift in which work is carried out in the shaft at the mine; undertake 4 hour inspections.

Statutory position	*compulsory /optional*	*Qualifications specified in regulations*	*Functions (summary)*
Cap/Oil Lamp Officer	compulsory	No.	Maintain cap/oil lamps in a safe condition and ensure that lamps are inspected and tested regularly; record defects; ensure that cap lamps are securely locked; and that no defective cap lamps are issued.
B.5 Open cut mines — officials in order of seniority specified in Schedule 1, CMRA 1982			
Senior Examiner of an open cut mine	optional	CCE and 2 yrs experience as an examiner.	Enforce observance of Act and regulations in part of mine over which he has jurisdiction; assumes Manager's functions when Manager and Deputy Manager absent.
Examiner of an open cut mine	compulsory	CCE	Assumes Manager's functions when Manager, Deputy Manager or Senior Examiner absent; enforce compliance with the Act and regulations in part of mine over which he has jurisdiction. Functions similar to Deputy in underground mine (including prescriptive rules for inspections).

a Compulsory where the mine is entered by means of winding or rope haulage, where machinery is not automatic and where there are less than 2 means of entry into or exit from mine.

b Where winding apparatus is not remotely controlled or automatic.

c Where work is carried out in the shaft at the mine.

Source: *Coal Mines Regulation Act 1982*, No 67, NSW Seniority of mining officials specified in Schedule 1, Parts A and B.

Table J.2: **NSW coal mining certification requirements**

Acronym	*Certificate*	*Coal Mining Qualifications Board rules to qualify for certificate*
CCM	Certificate of competence to be a manager	• Minimum age 21; • accredited degree or diploma in mining or other qualifications approved by the Board; or • part A exam on mine environment, fires, explosions and rescue; geotechnics and mine surveying; mechanical and electrical engineering; mining practices; plus • 3 years' practical experience in or about a mine (including up to one year at a mine other than an UG coal mine; and 2 years' underground experience in winning coal); • first aid certificate; • evidence of capability for testing flammable gas; • part B exam on legislation (CMRA, OH&S Act and Mines Rescue Act), mine ventilation and coal mining practice (application of engineering principles and legislation); and • oral exam on mining conditions and safety practices in NSW coal mines.
CCMOC	Certificate of competence to be a manager of an open cut mine	• Minimum age 21; • course or courses in engineering accredited by the Board (where a course is not readily available, applicant may apply to sit for an exam); • 3 years' practical experience at surface mining operations, one year of which shall have been at an open cut coal mine; • first aid certificate; • written exam on legislation (CMRA, and OH&S Act), and open cut mining practice (application of engineering principles and legislation); and • an oral exam (mining and related safety practices in NSW).

Acronym	*Certificate*	*Coal Mining Qualifications Board Rules to qualify for certificate*
CCUM	Certificate of competence to be an under-manager	• Minimum age 21; • accredited degree or diploma in mining or other qualifications accredited by the Board; or • part A exam on mine environment, fires and rescue; geology, geotechnics and surveying; mining practices and engineering (Note — compared with mine manager exams, the undermanager exams are a shorter time period with fewer questions and there are three papers instead of four); plus • 3 years' practical experience in or about a mine (including up to one year at a mine other than an UG coal mine; and 2 years' underground experience in winning coal); • first aid certificate; • evidence of capability for testing flammable gas; • part B exam on legislation (CMRA, OH&S Act and Mines Rescue Act), mine ventilation and coal mining practice (application of engineering principles and legislation); and • oral exam (mining conditions and safety practices in NSW).
CCD	Certificate of competence to be a deputy	• Minimum age 21; • accredited degree or diploma in mining or other qualifications accredited by the Board; • 3 years' practical experience in or about a mine (including up to one year at a mine other than an UG coal mine; and 2 years' underground experience in winning coal); • first aid certificate; • evidence of capability for testing flammable gas; • written exam on coal mining practice and legislation; and • oral exam relating to duties of deputy, mining conditions and safety practices in NSW.

Acronym	*Certificate*	*Coal Mining Qualifications Board Rules to qualify for certificate*
CCE	Certificate of competence to be an open cut examiner	• Minimum age 21; • accredited engineering or TAFE course and one year's experience in an open cut coal mine; or • board approved Australian statutory qualification in open cut mining and 3 years' experience at an open cut mine (at least one year in production and at least 3 months in open cut coal); or • in lieu of formal qualifications, a minimum of 5 years' experience in supervising production at a large open cut mine and in addition, at least 3 months' experience in open cut coal mining; and • first aid certificate; • written exam on legislation (CMRA and OH&S Act) and practical open cut operation; and • oral exam relating to mining and safety in NSW.
SP	Shotfirer's permit for an OC mine	
CCMME	Certificate of competence to be a mine mechanical engineer	• Minimum age 21; • accredited course in mechanical engineering; • first aid certificate; • one year's experience in or about a coal mine associated with mechanical engineering aspects of installation, examination, testing and maintenance of plant and equipment — 6 months' experience in underground/OC depending on which mine obtaining certificate for; • written exam in mechanical engineering applied to mining; and legislation; and • oral exam on colliery mechanical engineering and related safety practices in NSW.

Acronym	*Certificate*	*Coal Mining Qualifications Board Rules to qualify for certificate*
CCMEE	Certificate of competence to be a mine electrical engineer	• Minimum age 21; • accredited course in electrical engineering; • first aid certificate; • one year's experience in or about a coal mine associated with installation, testing, examination, and maintenance of plant and equipment — at least 6 months' underground experience (or six months' experience in an open cut coal mine if MEE of open cut coal mine); • written exam on electrical engineering applied to mining (including relevant aspects of legislation) and legislation (CMRA and OH&S Act); and • oral exam on colliery electrical engineering and related safety practices in NSW.
CCMS	Certificate of competence to be a mine surveyor	• Minimum age 21; • accredited course in surveying or other course approved by the Board or sit written exam on mathematics and surveying; applied surveying; • first aid certificate; • practical experience in surveying mines for a period of at least four years, except where candidate has accredited qualification in surveying, has passed through a regular course of mining study and has accredited qualification. In latter case, two years' practical experience in surveying at an underground or open cut mine will be acceptable; • prepare surveys and mine plans for submission to examiners; • written exam on mathematics and applied surveying, mine surveying computations and principles; and legislation (Surveying and Drafting instructions for Coal Mines Surveyors; CMRA and authorities and acts for lease applications); • oral exam on surveying; and • practical demonstration of surveying skill.

Source: Coal Mining Qualifications Board, rules for the conduct of examinations.

Table J.3: **Queensland coal mining officials (indicative list only)**[a]

Statutory position	*Compulsory/optional*	*Qualifications specified in the regulation*
Superintendent	optional	✓
Mine Manager	compulsory	✓
Undermanager, Underground Foreperson or Overperson (UG)	optional	✓
Assistant Manager or Supervisor (OC)	optional	✓
Deputy (function is to make inspections and carry out such other duties as to presence of gas, ventilation, state of roof and sides and general safety as are required by Act and rules of mine)	compulsory	✓
Open Cut Examiner (function is to make such inspections and carry out such other duties as to the state of the sides and the general safety of the open cut excavation)	compulsory	✓
Certificated Mine Electricians	compulsory[b]	✓
Assistant Mine Electrician	optional	✓
Mine Surveyor		✓
Ventilation Officer	compulsory[c]	✓
Miners Officers (elected by workers at a mine to inspect a mine and if unsafe, can suspend operations until mine certified safe by inspector)	optional	✓
District Union Inspector	optional	✓
Winding Engine Driver	compulsory[d]	✓
Pitheadmen and Head Banksmen (UG)	compulsory[e]	
Pitbottomers (UG)	compulsory[e]	
Fire Officer (UG)	compulsory	✓
Shotfirers	compulsory[f]	✓

a Order of seniority not specified in the legislation.
b Where electricity is used.
c Taken to be the mine manager if no one else is appointed.
d Whilst winding engines are being operated.
e When men are being raised or lowered in a shaft.
f Where charging, loading, or firing explosives.
Source: *Coal Mining Act 1925*, (Qld).

Table J.4: **NSW non-coal mining statutory positions**

Statutory position	*compulsory /optional*	*Qualifications specified*	*Summary of functions*
Inspectors (Chief, Deputy, Senior Inspector, Electrical, Mechanical Engineering)	optional (Governor may appoint)	CCM Degree or diploma of mining, electrical or mechanical engineering.	Enforce compliance with the Act and undertake safety checks.
Manager	compulsory	CCM granted under *MIA*; or certificate approved by Board of Examiners of Managers; or CSM granted under the *MIA*; where certificate relates to class of mine. Or — another person where have special approval from Chief Inspector where mine employment does not exceed 20 people.	Reside in vicinity, exercise daily personal supervision, and be responsible for control, management and direction of the mine.
Engine-Driver	compulsory	CCED or certificate approved by the Board of Examiners of Engine-drivers.	In charge of machinery of a class or description in use at any mine in which steam, water, electricity, gas, oil or air or any two or more are used as motive power (except water power used for pumping).

Source: *Mines Inspection Act 1901 (NSW).*

Table J.5: **NSW non-coal mining certification requirements**

Acronym	*Certificate*	*Requirement to pass certificate*
CCM	Certificate of competence to be a manager.	Pass exam set by Board of Examiners of Managers, produce satisfactory evidence of sobriety, experience, ability and general good conduct and practical experience in a mine for at least 3 years.
CSM	Certificate of service as a manager (for above ground mines).	Board of Examiners of Managers satisfied that person has had satisfactory experience in NSW as manager of an above ground mine in or about which more than 20 people were employed.
CCED	Certificate of competence as an engine-driver.	Pass exam set by Board of Examiners of engine-drivers, produced evidence of physical fitness and that sight, hearing and other faculties are unimpaired.

Source: *Mines Inspection Act 1901 (NSW).*

Table J.6: **Queensland non-coal mining statutory positions**

Statutory position	*compulsory /optional*	*Qualifications specified*	*Summary of functions*
Manager	compulsory	First-class mine manager's certificate of competence; or person approved by Board of Examiners; or minimum qualification specified by the Minister	Personally in charge of the mine and the performance of the work done therein and shall be responsible for the control, management and direction of the mine and such work.
Persons to assist manager	optional		

Source: *Mines Regulation Act 1964 (Qld).*

Table J.7: **Union involvement specified by Queensland legislation**

Legislation	*Area of union involvement*	*How union is involved*
Coal Mining Act 1925	s.70A, District union inspector (optional).	United Mine Workers Federation of Australia can appoint by ballot of members 3 district union inspectors. Each must hold at least a deputy certificate. Power to inspect mines, and suspend operations until certified safe by inspector.
Mines Regulation Act 1964	s.18, District Workers Representatives (optional). The function of these representatives is to inspect mines (with notice) twice a month, or more often if the representative considers that the mine may be unsafe. Representatives have the power to suspend work if there is danger to life until mine is certified safe by an inspector.	May be appointed by the Minister from a list of names submitted by each union with members employed in or about a mine or mining operation Submitted persons must have had at least 5 years' experience in mining.

Sources: Queensland regulations (various).

Table J.8: **Union involvement specified by NSW legislation**

Legislation	*Area of union involvement*	*How union is involved*
Coal Mines Regulation (Election of check inspectors, district check inspectors and electrical check inspectors) Regulation 1984	District Check Inspector (Functions outlined in above statutory position table.)	Under s.6, persons entitled to vote at an election of a district check inspector for a mine are the persons employed in or about the mine who are members of the Australian Coal and Shale Employees Federation (ACSEF). (The ACSEF is now part of the CFMEU.)
Coal Mines Regulation (Election of check inspectors, district check inspectors and electrical check inspectors) Regulation 1984	Conduct of elections for check inspectors, district check inspectors and electrical check inspectors.	Under s.8, elections of check inspectors, district check inspectors and electrical check inspectors for a mine shall be conducted by a person elected by a committee consisting of a representative from each union which has members who are persons employed in or about the mine.
Mines Rescue Act 1994	Mines Rescue Board of NSW (Principal functions to provide rescue services for underground coal mines. May provide services to other mines at its discretion.)	Under s.10, (3)(b), of seven directors in all: (i) one Director of the Board to be nominated by the Australian Colliery Staff Association; and (ii) two Directors of the Board to be nominated by the United Mine Workers' Division of the CFMEU.
Mines Inspection Act 1901	s.29, Hours of work and associated working arrangements below ground.	Under s.1, except in cases of emergency, a person is not to be employed below ground in a mine for more than 8 consecutive hours at any time or for more than 48 hours in a period of 7 consecutive days, and each person employed below ground in a mine is to have at least one full day of 24 consecutive hours off work in each period of 7 consecutive days. Under s.2, manager may alter conditions under s.29(1) if has consulted with employees and representative of any trade unions representing employee and must obtain agreement of not less than 65 per cent of employees before making alterations.

Source: NSW regulations (various).

K THE WORK MODELS

This appendix describes the basic characteristics of the black coal mining work models and assesses their flexibility with respect to demarcation and seniority.

The work models are outlined at Schedules E and F to the P&E Award (September 1990). They were introduced as a result of the *1990 Coal Mining Industry Restructuring Agreement* between the production and engineering unions and the employers at a national level. The parties to this Agreement decided to:

- undertake a fundamental review of work organisation;
- provide a rewarding work environment for employees through access to more varied, fulfilling and better paid jobs; and
- establish a simplified award structure. (P&E Award 1990, p. 59)

As part of the review of work organisation, the work models were developed by two National Joint Working Parties, one for the open cut sector and one for the underground sector. Coal Industry Tribunal (CIT) decisions of 1991 and 1994 required that the work models be implemented by agreement at site level.[1]

K.1 Description of the models

While the details of the models differ from mine to mine, most are based on the models outlined in the P&E Award. There are three basic elements:

1. Workers are divided into two streams based on the tasks undertaken — production and engineering. There is limited provision for employees in one stream to gain skills associated with the other stream.

   The production stream includes all skills required to carry out coal handling and preparation work. Some lower level engineering skills are also included to enable production workers to undertake routine inspections, servicing, minor maintenance, and running repairs.

   The engineering stream includes core technical skills relating to the trades — that is, mechanical and electrical skills. Machine operating skills (associated with the production stream) sufficient to enable engineering

[1] For example, the CIT decided that, for the underground work model: "the model is not to be implemented before production to the Tribunal of a site agreement" (CR 4569, 12 October 1992, p. 9).

workers to test operate production equipment before or after repairs or to drive production equipment short distances or operate mobile machinery to effect repairs or installation are also included.

2. A simplified pay system (relative to that outlined in the main body of the P&E Award) — with pay based on acquisition of skills rather than narrow occupational definitions (see Table K.1).

   As Wooden et al (1996) pointed out, while there is greater dispersion in pay rates under the work models than in the traditional Award rates, in practice most employees will be clustered around pay levels 3 or 4 and above. This is because the system is set up to speed employees to levels 3 and 4.

   > ... the priority will be to progress employees to Level 3 production/level 4 engineering as quickly as reasonably possible. (P&E Award, p. 69)
   >
   > To facilitate the movement of employees from levels 1 and 2, training priority will be given to employees in those levels. (P&E Award, p. 68)

   However, the employer may limit the number of employees appointed to upper levels (4, 5 and 6 for open cut mines and 5 and 6 for underground mines).

- Training costs are incurred by employers.

K.2 Demarcation

Relative to traditional Award arrangements, the work models offer significant scope for a reduction in demarcation.

Under traditional pay arrangements in clause 8 of the P&E Award, minimum pay rates are specified for nine groups of occupational classifications — groups A to I. Within each group there are up to 32 occupational/job classifications — though typically fewer than 10 (see Table K.1). This allows for significant demarcation based on:

- occupations — workers are attached to jobs with no switching of tasks between occupations. For example, pay group B includes sinkers and washery operators — neither would perform any aspect of the other's work; and
- equipment capacity — some occupational classifications include different pay rates for operating equipment of different capacities. (In some cases, pay levels and capacities associated with them differ between States.) For example, referring to Table K.2, a truck driver in pay group A would not drive trucks of more than 15 tonnes capacity. Similarly, a truck driver in

pay group B would not drive trucks of capacity outside the range 15–49 tonnes.

Table K.1: **Minimum Wage Rates, Clause 8, P&E Award**

Minimum wage rates			***Wage rates for work models (employees employed in accordance with Schedules E and F)***				
			Open cut		*Underground*		
Award pay group	*No. of job classific'ns in pay group*	*Minimum pay rate*	*Levels*	*Wage rates*	*Levels*	*Wage rates*	
						(1)[a]	*(2)*[b]
		$/week		*$/week*		*$/week*	*$/week*
A	9	516.50	0	516.50	1	516.50	516.50
B	30	529.00	1	542.40	2	529.00	542.40
C	32	543.00	2	568.30	3	543.00	581.30
D	8	561.00	3	594.20	4	571.60	620.10
E	9	571.60	4	620.10	5	591.20	653.90
F	9	592.20	5	653.90	6	612.80	697.90
G	6	612.80	6	697.90			
H	2	627.00					
I	2	644.50					

a On implementation.
b On attainment of productivity target.
Source: Clause 8, P&E Award.

The work models would appear to limit the scope for both these types of demarcation. In terms of occupations, CIT decision 4505 noted an example of how the work models might reduce demarcation in practice:

> Acquisition of skills will lead to a breakdown of current demarcation inflexibilities. The example was given of a brick layer currently doing some work who might require a small excavation. At present this would require a member of the FEDFA to come and dig (mechanically) the hole for the bricklayer. If the bricklayer has the appropriate training to operate a small machine then it will not be necessary to wait for the organisation to produce another person but the bricklayer will be able to use the machine to dig the hole himself. It was emphasised that a person need to be trained and be accredited with the skill to use the skill. (CIT decision CR 4505, 13 January 1992)

In terms of machine capacity, the work model requires production workers to operate all equipment of a particular type (for example, all drills or all

draglines) on site with no separate provisions for equipment of different capacities or in different geographical locations.

In addition, the intent of the work models was to limit demarcation based on union membership. Schedule F (the underground work model) states:

> ... where multiunion coverage of work exists, union membership is not to restrict the use of skills in the model. Unions which do so restrict will be adjudged to be acting contrary to the work model and to this determination. (P&E Award, p. 77)

and:

> ... mineworkers shall utilise all the skills in the stream for which they have been trained and accredited. (P&E Award, p. 89)

However, the delineation of work into streams still restricts the allocation of workers to tasks. This can have significant negative effects on labour productivity and unit labour costs.

Table K.2: **Examples of Award pay rates based on machine capacity**

Pay Group	***Occupation***			
	Truck driver	*Crane operator*	*Grader operator*	*Dragline operator*
	tonnes	*tonnes*	*kilowatts of power*	*cubic metres*
A	15			
B	15–49	20	150	
C	50–119	20–40	150 +	1525 (trainee Qld)
D		40 +		1525
E	120–174			1525–2675 (trainee Qld)
F	175 +			1525–2675 or 2675+ (trainee Qld)
G				2675–80 (Qld) or 2675–46 (NSW)
H				80+ (Qld)
I				46+ (NSW)

Source: Clause 8, P&E Award.

K.3 Seniority

The work models also allow for seniority in the allocation of training and promotion.

Where employers apply limits to the number of employees promoted to upper pay levels, seniority rules generally govern the allocation of training and the allocation of employees to these higher level positions. For example, Schedule F (the underground work model) specifies:

> A new employee at a mine shall not be appointed to levels 5 and 6 unless there are no existing employees at that mine in levels one to four inclusive who are suitable for appointment. (P&E Award, p. 95)

Moreover, the open cut model specifies:

> Unless mutually agreed otherwise, all things being equal the longest serving employee at the mine will be offered the training opportunity. (P&E Award, p. 69)

While the models expressly prohibit seniority in the allocation of employees to tasks, there is some scope for custom and practice to be maintained in the reference to 'mine site arrangements' and thus for seniority to be applied through custom and practice:

> In the new work models, seniority plays no role in the day to day allocation of an employee to a task. Mine site arrangements that currently exist and are used to allocate employees within a task (not to a task) will need to be discussed at the mine site. (P&E Award, p. 88)

L ECONOMY-WIDE EFFECTS OF PRODUCTIVITY CHANGE

This appendix presents results of quantitative analysis of the economy-wide impact of changes in productivity in the black coal industry. The analysis was commissioned by the Productivity Commission from the Centre of Policy Studies (CoPS) at Monash University.

L.1 Modelling the black coal industry

The modelling was undertaken using MONASH, a computable general equilibrium model of the Australian economy developed by CoPS. The Commission chose to use the MONASH model, with modifications described below, because it is a dynamic general equilibrium model. As such, it can provide insights into the long-term impact of productivity changes on the black coal industry, the economy as a whole, and other industries. The choice of model and major assumptions underlying the modelling scenarios were refereed by two external, independent experts, Dr Rod Tyers and Mr David Vincent. Their comments are summarised in Attachment L8. Copies of their written reports are available from the Commission on request.

L1.1 MONASH-Coal

For the purposes of modelling the Australian black coal industry, some modifications to the MONASH model were required. These modifications resulted in a new version of MONASH called MONASH-Coal (see Industry Commission 1997b, Appendix O, for a description of the MONASH model).

In the MONASH model, the input-output database provides a breakdown of the distribution (sales) of commodities (such as coal) and the costs of the industries producing them. This database draws on the Australian Bureau of Statistics (ABS) input-output tables, which recognise a single industry/commodity *Coal; oil and gas*. To model black coal, this industry/commodity had to be disaggregated. Using ABS input-output commodity card data, *Coal; oil and gas* was split into its components: black coal, brown coal, crude oil, natural gas and liquefied natural gas. However, the ABS input-output data do not recognise the two major black coal types — thermal and coking.

The International Energy Agency (IEA) provides detailed energy supply and consumption data for coking, steaming, and sub-bituminous coal. This data was used to provide the necessary sales splits for black coal. The IEA steaming and sub-bituminous coal categories were combined to create thermal coal data for the MONASH-Coal database.

Sales structure

In the IEA data, raw coking coal is not consumed by any industry directly, but is first transformed into oven and gas coke. With some exceptions (such as non-ferrous metals and non-metallic minerals), coke and coking gas is consumed exclusively by the iron and steel industry. Since MONASH does not separate the coking process, it has been assumed that the domestic consumption of coking coal was allocated on the basis of the final consumption of coke. The only final user of black coal in the MONASH database is exports. This has been apportioned to coking and thermal coal in line with IEA export intensities (see Tables L.1 and L.2).

Table L.1: **MONASH-Coal sales structure for coking coal**

User	*Per cent of total*
Basic iron and steel	7
Exports	93
Total sales	**100**

Source: CoPS estimates.

Given that the sales structure of black coal is known (via the ABS input-output commodity card details), and that the sales structure of coking coal can be inferred from the IEA data, the residual is the sales structure of thermal coal.

Table L.2: **MONASH-Coal sales structure for thermal coal**

User	*Per cent of total*
Electricity	34
Other domestic industries	12
Exports	54
Total sales	**100**

Source: CoPS estimates.

Cost structure

Data for apportioning costs were more difficult to obtain. Initially, a simple pro-rating procedure was used to apportion the share of coking and thermal coal in the total sales of black coal. This method implies the same cost structure for coking and thermal coal as for all black coal. Adjustments were then made using detailed data for wages and gross operating surplus supplied by the ABS (see Table L.3).

Table L.3: **MONASH-Coal black coal cost structure** (per cent)

Input	*Thermal coal*	*Coking coal*
Labour	23	22
Capital	20	19
Intermediate inputs	46	40
Other costs[a]	11	18
Total costs	**100**	**100**

a Includes royalties, returns to land and working capital.
Source: CoPS estimates.

L.2 Modelling framework

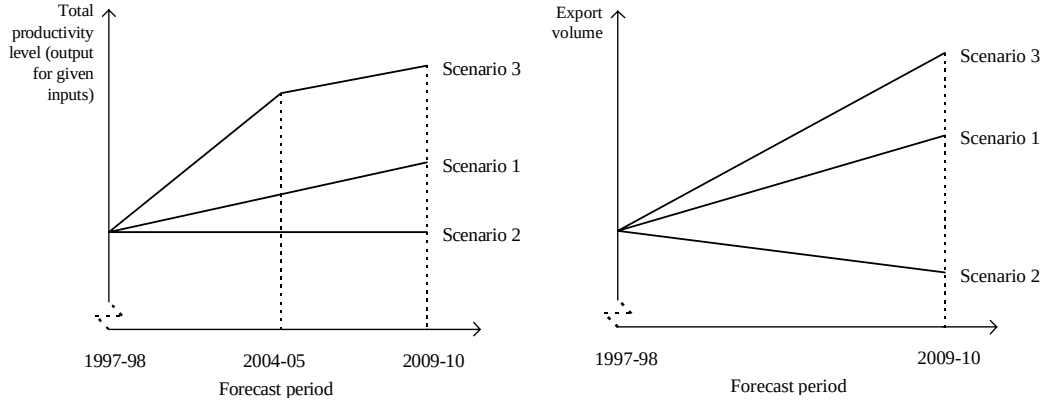
Five scenarios have been modelled by the CoPS which cover a range of productivity outcomes in the Australian black coal industry, as well as possible reactions in international markets. The impact of productivity change is assessed over a 12-year period, from 1997–98 to 2009–10. This period was chosen because it provides a plausible time-frame within which the black coal industry can implement assumed productivity changes and the economy can adjust. Table L.4 summarises the major assumptions underlying each scenario.

It should be emphasised that all the scenarios are illustrative only, designed to isolate the potential impact of productivity change in the black coal industry on the industry's performance and the economy at large. Box L.1 provides a stylised picture of the productivity assumptions incorporated in Scenarios 1 to 3 as well as a representation of export outcomes.

Table L.4: **Summary of major assumptions, Scenarios 1 to 5**

	International market behaviour		
Productivity and cost change in the coal industry	*Competitive world markets*	*Foreign buyers capture part of cost savings*	*Foreign buyers capture full amount of cost savings*
Productivity growth in line with recent trend	Scenario 1 (the base case)		
No productivity growth after 1997–98	Scenario 2		
Accelerated productivity growth	Scenario 3	Scenario 4a	Scenario 4b
Accelerated productivity in coal plus best practice in rail transport	Scenario 5a		
Accelerated productivity in coal plus removal of excess rail charges	Scenario 5b		

Box L.1: **Productivity and export levels in Scenarios 1, 2 & 3[a]**



a This is a stylised illustration of the relationship between assumed productivity gains and export growth. It has not been drawn to scale.

Scenario 1: base case scenario for the economy

Scenario 1, referred to as the base case, sets a 'business as usual' course for the Australian black coal industry, incorporating productivity improvements and structural developments already under way. Base case projections incorporate ABARE predictions for coal export volumes and prices (taking into account

developments in several Asian economies) and reflect an assumption that the average rate of total factor productivity growth observed in the black coal industry over recent years — a little over 1 per cent — continues from 1997–98 until 2009–10.

Under this scenario, in line with ABARE forecasts, the black coal industry is projected broadly to maintain its current shares in international markets. However, given the outlook for subdued growth in world coal markets and weak domestic demand for coal, the black coal industry overall is not expected to grow as rapidly as the average for all domestic industries.

If the base case projections for the black coal industry prove too pessimistic, or optimistic, actual export volumes and prices will vary from base case levels. The implications of this for the base case and the results in the remaining scenarios are discussed below.

The role of the base case

This scenario provides a 'base case' scenario for the whole economy as well as the black coal industry over the forecast period. For modelling purposes, it provides a yardstick against which the remaining scenarios can be assessed. As in the case of coal exports, the implications for the economy of slower growth in major Australian export markets have been taken into account. But circumstances can change.

Importantly, any revision of the base case estimates is unlikely to invalidate the qualitative nature of the results in the remaining simulations. This is because changes in productivity performance of the black coal industry are assessed *relative* to the base case projections. The impact of productivity changes *relative* to the base case (the assessment of which is the main objective of the modelling exercise) will not change significantly if the base case scenario alters, though absolute magnitudes would be affected.

Scenario 2: no productivity improvement

Scenario 2 presents a very pessimistic outlook. It assumes that productivity in the Australian black coal industry remains unchanged at its 1997–98 level over the forecast period. Relative to the base case, this scenario models the impact of a deterioration in productivity in the industry. It is designed to illustrate the importance of productivity growth in this heavily export-oriented industry. Exports are projected to fall relative to both the base case projections and current levels. With the substantial decline of a major export industry, national income is also projected to fall significantly.

Scenario 3: accelerated productivity change

Scenario 3 presents the opposite side of the productivity spectrum. It assumes that labour and capital productivity improve by an additional 5 per cent per year (relative to growth in the base case) between 1998–99 and 2002–03.

For the period 2003–04 to 2009–10, it is assumed that total factor productivity growth resumes its base case rate of a little over 1 per cent per year. Under these assumptions, and assuming competitive world markets, Australian coal exports rise rapidly, both relative to Scenario 1 and current levels, with a significant beneficial impact on national income (sensitivity analysis was carried out in order to gauge the impact on these results of less responsive export demands).

Scenario 4: accelerated productivity change leading to lower coal prices

This scenario models productivity improvements under alternative assumptions about the behaviour of international markets. Specifically, it explores the impact of accelerated productivity improvements when foreign buyers of Australian coal capture part (Scenario 4a) or all (Scenario 4b) of the benefit of cost reductions, by negotiating lower prices for Australian coal. In Scenario 4a, the black coal industry expands output using its existing labour and capital supplies, but the lower price discourages further investment and expansion of the industry. The gains in this scenario for the black coal industry and the economy at large are still significant, though smaller than if prices had not fallen.

Scenario 4b presents an extreme case where foreign buyers of coal capture all of the cost reduction via lower coal prices. Coal export and output volumes still grow relative to 1997–98, but employment and investment in the industry fall very rapidly. While the Commission considers this scenario to be unrealistic, it demonstrates that even if coal prices are forced down by the full amount of cost reductions, the improvement in the productive capacity of the economy resulting from productivity improvements, can still generate higher national output.

Scenario 5: accelerated productivity change in coal coupled with best practice productivity in rail transport of coal and accelerated reductions in coal rail freight rates

Scenario 5a examines the impact of achieving accelerated productivity change in the black coal industry itself as well as in rail transport of coal. Scenario 5b

examines the impact on the coal industry of a more rapid reduction in excess rail freight charges than assumed in the base case.

In Scenario 5a, rail freight rates for coal are assumed to fall by 20 per cent over five years, closing the estimated gap between current levels of rail operating efficiency and best practice. Not surprisingly, under these assumptions, the gains to the black coal industry and the economy are estimated to be larger than the gains achieved in Scenario 3. Scenario 5b also estimates additional gains for the coal industry, albeit smaller than in Scenario 5a. Box L.2 provides a simple conceptual analysis of the impact of each scenario on Australian coal exports.

Issues in modelling

Modelling provides a tool for illustrating the potential impact of productivity change in the black coal industry. While the intention is to capture and highlight major implications of productivity change, any modelling inevitably and necessarily abstracts from some aspects of reality. For example, MONASH-Coal does not take into account transitional costs of adjustment. Any such costs should be taken into account when quantifying the full impact of productivity changes on economic welfare.

It also should be noted that the results of the modelling simulations, as in the case of all models, are influenced by the data and behaviour incorporated in the model and assumptions made about different aspects of the economy. (For a discussion of the economic theory which underlies MONASH see IC 1997b, Appendix O.) Appendix M discusses some conceptual issues relevant to assessing the effects of productivity changes in the black coal industry. These include the role of the base case and base case projections, the measurement of changes in economic welfare, ownership of capital, terms of trade effects, and structural adjustment in labour and capital markets.

L.3 Scenario 1: base case scenario for the economy

Scenario 1, described as the base case scenario, provides a picture of how the Australian black coal industry, and the rest of the economy, might develop over the forecast period. The base case scenario for the period 1997–98 to 2009–10 is generated by imposing on the MONASH-Coal model, a range of assumptions about likely cyclical and structural developments in the black coal industry and the Australian economy.

Box L.2: **Conceptual approach to modelling the black coal industry**

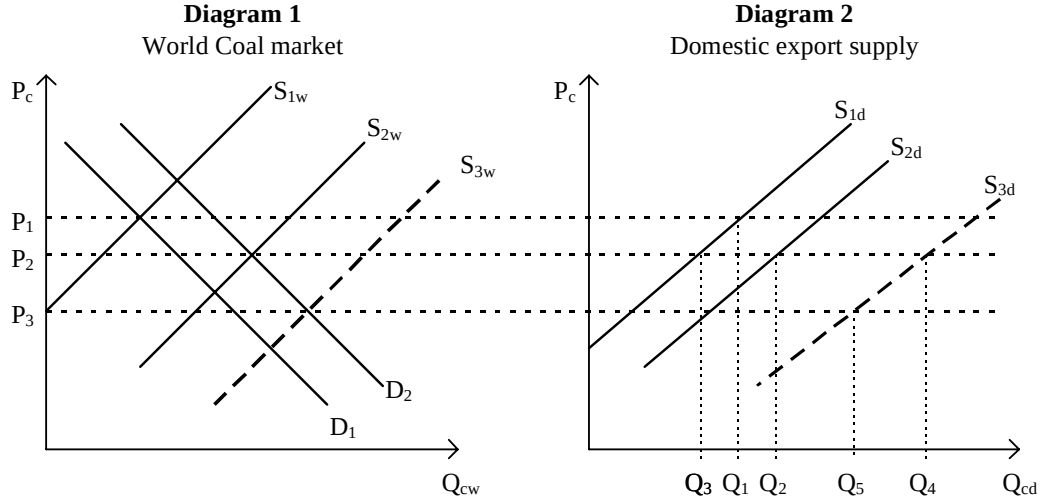


Diagram 1 depicts the world coal market where the interaction of world demand for and supply of coal determines the world price. Initially, with demand D_1 and supply S_{1w}, the world price is P_1. At this price, with domestic export supply represented by S_{1d}, Australian suppliers of coal export Q_1 tonnes of coal (**Diagram 2**).

Scenario 1 (base case scenario)

It is assumed that world demand for coal grows, which of itself tends to push up world prices (represented by the shift of the world demand curve to D_2). However, it is also assumed that world supply increases by an even greater amount (see Attachment L1 for a discussion of these assumptions). Thus the world supply curve shifts out to S_{2w} and the *net* result is a reduction in the (relative) world coal price to P_2.

Without any change in productivity (that is, all else constant, no shift in the local supply curve) this reduction in price would lead to a reduction in Australia's exports to Q_3. In order to maintain market share (in the context of expanding world coal trade) Australia must increase its supply of coal for any price level. In the base case scenario, this is assumed broadly to be achieved by improving productivity which, by reducing unit costs, shifts the supply curve to the right (to S_{2d}). Coal exports thus grow sufficiently (to Q_2) to maintain Australia's world market share (Attachment L4 explains the nature of the productivity improvements assumed in Scenario 1).

Scenario 2 (no productivity change)

It is assumed that the domestic black coal industry does not improve its productivity beyond 1997–98, despite a more competitive world market. This can be analysed as if the initial domestic supply curve (S_{1d}) remains fixed.[a] Given projected lower relative coal prices, export volumes contract, represented by a movement along the initial supply curve S_{1d}. The new equilibrium volume of exports is Q_3.

Box L.2: **Conceptual approach to modelling the black coal industry** (continued)

Scenario 3 (accelerated productivity change)

If the Australian black coal industry were to implement productivity improvements more rapidly, this implies an outward shift of the supply curve *additional* to the shift assumed in the base case, say, to S_{3d}. Assuming that the resulting increase in Australian supply does not affect the world price (this assumption is relaxed below), exports jump to Q_4. Australia significantly *increases* its share of the expanding world coal market.

Scenario 4 (negotiated lower coal prices)

It is possible that, by achieving larger productivity changes (Scenario 3), the resulting shift of the Australian supply curve (to S_{3d}) allows foreign buyers to negotiate a lower price, say P_3 (see **Diagram 1**). This reduction in price induces a lower level of exports than if the price remained at P_2. The new equilibrium is reached by a movement along the Scenario 3 supply curve S_{3d}. Nonetheless, as drawn, exports at Q_5 are still higher than without the productivity improvement. Indeed, only if foreign buyers capture the entire cost reduction will export expansion be choked off.

Scenario 5 (improvements in productivity in coal transport and handling)

A decline in coal transport and handling costs due to productivity improvements (or, indeed, a reduction in 'monopoly' rail rents) can be modelled, in the above diagram, as a downward shift of the black coal industry supply curve. In other words, in this framework, the impact on coal competitiveness and exports will be similar, in qualitative terms, to an improvement in productivity at the mine itself.

a The export supply curve can shift in response to factors other than productivity changes including shifts in the domestic demand for coal. If local demand falls (due to improved efficiency in electricity generation, for example), the coal export supply schedule would shift to the right and exports could increase without additional productivity improvements. But as this would occur in all scenarios, exports in Scenario 2 (no productivity change) must be lower than exports in Scenario 1, the base case (for a given export price).

Scenario 1 assumes that total factor productivity in the black coal industry will continue to improve at broadly the same rate (a little over 1 per cent per year) as in recent years. This assumption is modest compared with plausible productivity improvements in the industry.

For the base case, assumptions must be made about macroeconomic variables including output and employment growth, about changes in international market conditions which affect world commodity prices and about changes in technology and consumer preferences.

These assumptions, when combined with the theory, data and other parameters of the MONASH model, determine projections for the structure of the economy for each year of the forecast period. Major assumptions underlying the base case scenario are examined below.

L.3.1 Macroeconomic assumptions, 1997–98 to 2009–10

Projections for macroeconomic variables including GDP, real consumption, investment and international trade flows as well as growth in factors of production are imposed on the model. These estimates, which are based on macroeconomic projections by Access Economics and the Centre of Policy Studies, are summarised in Table L.5.

Table L.5: **Base case: growth in macroeconomic variables**

Macro variables	*Average annual percentage change 1997–98 to 2009–10*
Real GDP	3.0
Real investment	2.5
Real private consumption	2.9
Export volumes	5.5
Import volumes	3.9
Traditional exports	2.8
Employment (hours)	1.8
Real wage (producer)[a]	1.0
Consumer prices[b]	2.3
Terms of trade	-0.1
Real exchange rate (competitiveness index)[c]	0.0

a The producer real wage is defined as nominal wages relative to the prices received by producers (the GDP deflator), and thus gives an indication of the real cost of labour.

b In all deviation simulations (that is, Scenarios 2 to 5), the consumer price index acts as the numeraire. In other words, growth in the CPI is held at its base case level of 2.3 per cent per year.

c The real exchange rate (or 'competitiveness index'), in the MONASH-Coal model, is defined as the ratio of the domestic price of imports and domestic producer prices (as measured by the GDP deflator). A rise in the real exchange rate (real exchange rate depreciation) indicates that Australia has become more competitive relative to overseas suppliers; conversely, a decline in the real exchange rate (real appreciation) indicates a loss of international competitiveness. Box L.3 further explains the real exchange rate mechanism. In the base case, the real exchange rate is assumed to remain constant, reflecting an assumption that Australia's relative competitiveness will be broadly maintained.

Source: MONASH-Coal simulations.

Over the period 1997–98 to 2009–10, real GDP is assumed to grow at an average annual rate of 3 per cent. This is quite strong relative to average growth over the past decade, and reflects the view of Access Economics that economic developments in several Asian economies will have a significant short-term but less significant long-term impact on Australia's economic growth. As already noted, if these projections prove too optimistic, and the economy grows at a slower rate over the entire forecast period, the modelling results still stand in qualitative terms.

On the supply side of the economy, GDP is driven by employment and capital growth of around 2 per cent (with capital growth somewhat stronger than employment growth), and economy-wide productivity growth of around 1 per cent a year.

On the demand side, investment and private consumption are projected to maintain their shares of GNE, while the share of public consumption is expected to fall. Real exports and imports are projected to grow at 5.5 per cent and 3.9 per cent respectively, generating growth in the volume of net trade.

The base case scenario assumes that Australia, on the whole, maintains its international competitiveness, reflected in the assumption of no change in the real exchange rate over the long run. In the MONASH-Coal model, this means that the *domestic* price of imports rises in line with domestic prices (as measured by the GDP deflator). Box L.3 provides an explanation of the real exchange rate.

L.3.2 Base case projections for black coal

Base case projections for coal exports, domestic sales, output, employment, investment and productivity (where productivity is measured by the primary factor usage per unit of output) are summarised in Table L.6.

Projections for coal exports and domestic sales are based on a range of private and government sources. Attachments L1, L2 and L4 explain in detail the major assumptions underlying the black coal industry base case projections, including those for exports and export prices (Attachment L1), domestic and foreign demand (in particular electricity and steel industry demand) (Attachments L1 and L2), and productivity (Attachment L4).

Box L.3: **The real exchange rate and international competitiveness**

The real exchange rate provides a comparison of domestic costs (which determine the price of non-traded goods) and changes in costs in the rest of the world (which determine tradeable goods prices). It is formally defined as the domestic price of internationally tradeable goods relative to the domestic price of non-traded goods (mainly services).

A depreciation of the real exchange rate, called *real depreciation*, indicates that prices of tradeable goods (in $A) have risen relative to domestic costs. Real depreciation occurs when, all else constant, international prices rise, the Australian dollar nominal exchange rate depreciates, or when domestic costs fall due to productivity improvements or lower inflation.

Following a real depreciation, Australian suppliers of traded goods are in a better position to compete on international markets. Moreover, because the price of tradeable goods (imports and exports) has risen relative to the price of non-traded goods, domestic demand for tradeable goods falls. The net effect of increased supply and reduced domestic consumption of traded goods is an increase in Australia's net exports.

Conversely, *real appreciation* indicates a *decline* in competitiveness which leads to higher imports and lower exports.

In the MONASH model, the real exchange rate is formulated as the price of imports in Australian dollars, relative to domestic costs (as measured by the GDP price deflator).

The outlook for the Australian black coal industry in the base case scenario, which is consistent with ABARE export forecasts, is for subdued growth. This is based on projections for global demand and supply, the domestic market for coal, and the competitiveness of local producers. The ABARE forecasts, and hence the base case, incorporate energy users "own expectations about factors which will influence their energy use" (ABARE 1997g, p. 30), including climate change policies.

World supply of thermal coal, particularly from relatively new coal exporting countries such as Indonesia, is projected to outstrip world demand. Export demand for coking coal is predicted to be virtually stagnant, but competition is expected to be less intense in this market which Australia dominates in terms of both volume and quality. Currently, Australia supplies a little over 20 per cent of thermal coal traded internationally and around 40 per cent of coking coal traded internationally. According to ABARE, these shares are expected to change little in the future. More detail about these projections is provided in Attachment L1.

Table L.6: **Base case: projections for the black coal industry**

	Coking coal		*Thermal coal*	
	Average annual percentage change 1997–98 to 2009–10	*Level 2009–10 (index)*[a]	*Average annual percentage change 1997–98 to 2009–10*	*Level 2009–10 (index)*[a]
Export volume	1.7	123	2.2	130
Domestic sales volume	-1.6	82	1.3	117
Total production volume	1.6	121	1.9	125
Employment (hours)	-5.1	53	-4.5	58
Real investment	-2.7	72	-2.1	78
Primary factor use per unit of output[b]	-2.6	73	-2.9	70

a Index value with 1997–98 = 100.

b A *fall* in the usage of primary factors per unit of output indicates an *improvement* in total factor productivity. Because primary factors account for only part of total production costs, savings in factor use must be larger than one per cent per year in order to reduce unit costs by that amount.

Source: MONASH-Coal simulations.

ABARE and other forecasters predict virtually no growth in coal export prices over the forecast period (see Attachment L1, Table L1.2) and without adequate productivity improvements, the industry faces a price/cost squeeze.

For most of the forecast period it is assumed that some productivity improvements arise from opening new, more capital intensive mines and moderate reforms that result in productivity improvements in existing mines. Attachment L4 explains the basis of this assumption which implies higher capital intensity and lower employment in the industry, continuing a trend which has been evident for several years. However, as Attachment L4 explains, the opening of new mines is not a permanent solution to improving productivity. Eventually, scope for opening new mines and/or obtaining coal through capital intensive open cut techniques will diminish. This development has been incorporated in the base case projections.

Despite projected higher capital intensity in the black coal industry, real net investment in the industry is projected to decline from current levels. In other words, though net annual investment remains positive, growth of capital employed in the industry is anticipated to slow relative to recent growth in the industry and relative to projected capital growth in the rest of the economy.

Domestic demand for thermal coal is projected to grow, albeit at a lower rate than domestic sales for most other industries. This comparatively slow demand growth occurs despite fairly strong growth in the electricity industry (of around 3.1 per cent a year — see Table L.7), the dominant user of thermal coal. Improved efficiency in electricity generation (continuing an historical trend) and increased use of alternative primary fuels (especially gas) are assumed to reduce the demand for coal per unit of electricity output. In addition, more competitive supply arrangements in, and pricing of, electricity are expected to reduce the need for excess capacity which in the past has been required to meet unanticipated demand fluctuations. Development of the National Electricity Market and other factors could increase the share of natural gas in nation-wide electricity output. These possibilities are discussed further in Attachment L2.

Domestic sales of coking coal are projected to decline, reflecting projected weak growth of the local steel industry (see Table L.7) as well as increasing use of less coal-intensive technologies such as electric arc furnaces and pulverised coal injection. The impact on total coking coal output is small, however, as more than 90 per cent of Australia's coking coal is exported.

Given the outlook for exports and domestic sales, production of both coking and thermal coal is projected to grow by 1.6 per cent and 1.9 per cent per year respectively, compared with the base case projection for GDP growth of 3.0 per cent. Overall, therefore, the share of the black coal industry in the economy is projected to shrink under the base case assumptions.

It is estimated that total royalty collections (including both royalties paid directly to State governments and royalties collected through rail authorities) in NSW and Queensland remain broadly unchanged between 1997–98 (estimated to be around $650 million) and 2009–10. However, it has been assumed that remaining excess rail charges (or explicit monopoly rents) will be phased out by 2005–06, reflecting the impact of competition reforms under way. This is estimated to reduce rail revenue by around $300 million per year between 1997–98 and 2005–06. The basis for these assumptions is discussed in more detail in Attachments L3 and L6. If excess rail charges do not decline as assumed, the black coal industry's costs would be higher than projected in the base case. This would mean that potential gains for the industry from rail reform, modelled in Scenario 5, could be larger.

L.3.3 Base case projections for all industries

Base case projections for broad industry sectors are shown in Table L.7. These projections reflect macroeconomic assumptions as well as predicted changes in consumer tastes and production technologies, and specific commodity forecasts.

Table L.7: **Base case: real output projections for major industries**

	Industry	*Average annual percentage change 1997–98 to 2009–10*
1	Agriculture, forestry and fishing	2.9
2	Mining (including coal)	2.8
	Black coal — coking	*1.6*
	Black coal — thermal	*1.9*
3	Food, beverages and tobacco	2.9
4	Textiles, clothing, footwear	2.0
5	Wood and furniture	2.8
6	Paper, paper products	3.6
7	Chemicals	5.0
8	Non-metallic construction	3.0
9	Basic metal products	3.9
	Iron and steel	*1.2*
10	Transport equipment	4.3
11	Electronic equipment	5.8
12	Leather, rubber, etc.	4.0
13	Electricity, gas and water	2.9
	Electricity	*3.1*
14	Construction	3.0
15	Wholesale and retail trade	2.7
16	Transport and storage	4.1
17	Communications	6.7
18	Finance, business services	5.5
19	Ownership of dwellings	2.9
20	Public administration	1.8
21	Health, education, welfare	2.8
22	Hospitality, etc.	3.8

Source: MONASH-Coal simulations.

Communications, electronic equipment and finance and business services are projected to be the strongest growing sectors, followed by chemicals, transport equipment and transport and storage.

This pattern of growth reflects relatively strong investment and 'non-traditional' export growth as well as the continuing introduction of new communications and computerised technologies. Slow growing sectors include textiles, clothing and footwear, and public administration. Growth in mining and agriculture is projected to be slightly lower than projected GDP growth.

L.4 Scenario 2: no productivity improvement

In Scenario 2, it is assumed that there are no improvements in productivity in the Australian black coal industry beyond 1997–98. In other words, total factor productivity growth of a little over 1 per cent per year assumed in the base case, is eliminated. In cumulative terms, and relative to the base case, this implies a deterioration in total factor productivity of around 15 per cent over the entire period modelled. This extreme case is modelled in order to illustrate the role of productivity growth in an industry exposed to international competition.

L.4.1 Impact on the black coal industry

The impact of no further productivity growth on the black coal industry is summarised in Table L.8. Modelling results suggest that without any further productivity improvements after 1997–98, exports of thermal coal could be around 63 per cent lower than the base case projection for 2009–10. For coking coal, the decline in exports could be almost 40 per cent relative to the 2009–10 base case projection.

The large fall in thermal coal exports in part reflects the assumption that international thermal coal markets are intensely competitive (the elasticity of demand for Australian thermal coal exports is assumed to be -20). Evidence suggests that over the medium to longer term, rival producers could be expected to increase their capacity significantly.

Australia's exports of coking coal are assumed to be somewhat less vulnerable, reflecting Australia's large share of this particular market (the elasticity of export demand in this case is assumed to be -10). Hence, the fall in coking coal exports relative to the base case projection for 2009–10, is smaller than the estimated decline in thermal coal exports.

With exports falling significantly, investment and employment in the industry also fall more rapidly than in the base case. The negative impact on employment of a significant reduction in exports and output more than offsets the positive effect on employment of no further labour-saving productivity change in the industry. Employment in 2009–10 in thermal coal is estimated to be 17 per cent

below the base case projection, while employment in coking coal is estimated to be 13 per cent lower. Total industry investment in 2009–10 is estimated to be about 12 per cent below the 2009–10 level in the base case.

The export decline also has ramifications for State government revenues. It is estimated that by 2009–10 total royalty collections could be $218 million lower than in Scenario 1.

The results for this scenario are sensitive to the response of overseas buyers to a reduction in Australia's exports. As already noted, with international markets assumed to be competitive, a rise in production costs (relative to the base case) causes large falls in exports. If foreign demand were less sensitive to higher coal prices, the estimated fall in exports would be smaller. The sensitivity of the modelling results to changes in export demand elasticities is discussed in Section L.5.4.

Table L.8: **Scenario 2: impact on the black coal industry**

	Coking coal		*Thermal coal*	
	Average annual percentage change 1997–98 to 2009–10	*Percentage deviation from base case in 2009–10*	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case in 2009–10*
Export volume	-2.1	-37	-6.0	-63
Domestic sales volume	-1.6	0	1.0	-3
Output volume	-2.1	-36	-2.4	-40
Employment (hours)	-6.2	-13	-6.0	-17
Real investment	-3.7	-11	-3.2	-12
Primary factor use per unit of output	0	38	0	44

Source: MONASH-Coal simulations.

L.4.2 Economy-wide effects

Table L.9 indicates that significantly slower growth of the black coal industry delivers lower growth in real private consumption, investment and GDP. Real GDP is estimated to be 0.3 per cent lower in 2009–10 than in the base case. This represents a substantial loss — more than $2 billion in today's dollars.

The estimated relative decline in real private consumption (0.7 per cent) is larger than the decline in GDP for two reasons. First, in scenarios modelled as deviations from the base case, MONASH-Coal assumes that the marginal propensity to consume of Australians is unity (and the marginal propensity to save, zero). The basis and implications of this assumption for the financing of new investment are discussed in Appendix M. The net effect is that a reduction in GDP affects only one component of national expenditure, real private consumption.[1]

Second, the purchasing power of GDP is reduced by an induced decline in the terms of trade which amplifies the decline in real private consumption. The decline is a direct result of contraction of the coal sector and the consequent expansion of other traditional export industries. This expansion tends to reduce their export prices.

In addition, to the extent that foreigners own part of the existing capital stock, they will bear part of the predicted income (GDP) loss. This effect, which is not incorporated in the results, will moderate the estimated decline in real private consumption.

Table L.9: **Scenario 2: economy-wide impact**

Macro variables	*Percentage deviation from base case 2009–10*
Real GDP	-0.3
Real investment	-0.6
Real private consumption	-0.7
Export volumes	0.1
Import volumes	-0.7
Traditional exports	-5.4
Employment (hours)	-0.1
Real wages (producer)	-0.3
Terms of trade	-0.5
Competitiveness index	1.0

Source: MONASH-Coal simulations.

[1] It is also assumed that growth of real public consumption does not change from the base case (see Appendix M for further explanation).

Real wages are also lower than in the base case. Under the assumptions of the model, this fall is required to maintain aggregate employment growth at its base case level in the long run. Without a fall in real wages, and with the productive capacity of the economy reduced by lower productivity (relative to the base case), unemployment would rise. A very small decline in aggregate employment growth is reported in Table L.9. This arises because the productivity shock is spread evenly over each year of the forecast period. Thus the labour market (and real wages) has not fully adjusted to the assumed productivity shocks by 2009–10. Assumptions in the MONASH model about the labour market are discussed further in Appendix M.

L.4.3 Impact on other industries

As detailed in Table L.10, some sectors of the economy are estimated to grow at a faster rate than in the base case — namely agriculture, and non-traditional export and import-competing sectors. Most service industries experience slightly slower growth than projected in the base case, except hospitality, which is dominated by the export-oriented tourism industry.

Such restructuring of the economy is an inevitable response to the substantial decline in coal exports. In order to restore long-run balance of payments equilibrium, imports must fall and exports must increase to offset the fall in coal export receipts. Overall, the volume of trade is estimated to be smaller in 2009–10 than in the base case.

The adjustment is brought about by declining real national income (which reduces domestic demand for goods and services which, in turn, via real exchange rate depreciation (see Box L.3), reduces imports and encourages production of import-competing goods and exports), as well as reduced demand for factors of production by the black coal industry itself. These adjustments are explored further in Boxes L.4 and L.5.

Table L.10: **Scenario 2: impact on real output of major industries**

	Industry sector	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case 2009–10*
1	Agriculture, forestry and fishing	2.9	1.1
2	Mining (including coal)	1.9	-10.5
	Black coal — coking	*-2.1*	*-35.5*
	Black coal — thermal	*-2.6*	*-40.1*
3	Food, beverages and tobacco	3.0	1.0
4	Textiles, clothing, footwear	2.1	1.1
5	Wood and furniture	2.8	0.0
6	Paper, paper products	3.6	0.2
7	Chemicals	5.0	0.8
8	Non-metallic construction	3.0	-0.2
9	Basic metal products	4.0	1.2
	Iron and steel	*1.2*	*0.1*
10	Transport equipment	4.4	0.7
11	Electronic equipment	5.9	1.2
12	Leather, rubber, etc.	4.1	1.3
13	Electricity, gas and water	2.9	-0.2
	Electricity	*3.1*	*-0.4*
14	Construction	2.9	-0.8
15	Wholesale and retail trade	2.7	-0.2
16	Transport and storage	4.0	-0.5
17	Communications	6.7	-0.5
18	Finance, business services	5.5	-0.3
19	Ownership of dwellings	2.8	-0.3
20	Public administration	1.8	0.0
21	Health, education, welfare	2.8	-0.1
22	Hospitality, etc.	3.9	0.4

Source: MONASH-Coal simulations.

L.5 Scenario 3: accelerated productivity improvements

Compared with Scenario 2, this scenario depicts the opposite side of the productivity spectrum. Scenario 3 models feasible improvements in labour and capital productivity additional to those assumed in the base case. Productivity improvements are assumed to occur smoothly over five years, beginning in 1998–99. Thereafter, for the period 2003–04 to 2009–10, total factor productivity growth resumes its annual trend (base case) rate of around 1 per cent.

Overall, average labour and capital productivity growth in the industry accelerates (relative to base case growth) by around 5 percentage points per year between 1998–99 and 2002–3. Over the 12-year period modelled, this leads to labour and capital productivity growth of around 5 per cent per year compared with around 2.8 per cent annual growth in the base case. The acceleration is assumed to occur through relatively rapid (relative to historical trends) changes in work and management practices in all aspects of mining operations — that is, in the mines themselves, in coal preparation plants and in mine administration.

Examples of the changes in management and work arrangements that might contribute to accelerated productivity improvements include reductions in idle time caused by inefficient shift change-overs and rostering of breaks, 'early knock off', lack of flexibility in roster arrangements and of arbitrary union-based demarcation rules.

Because reductions in idle time improve the productivity of both capital and labour, a neutral productivity improvement — that is, one that equally improves labour and capital productivity — has been modelled. In other words, the productivity change as modelled has not affected the capital-labour ratio implied in the base case. For this simulation, it is assumed that there is no scope to make further savings in intermediate input use.

L.5.1 Impact on the black coal industry

Table L.11 summarises the estimated impact of comparatively large productivity gains on the industry's output, exports, employment and investment.

Exports of both coking and thermal coal are estimated to increase substantially under these productivity assumptions. Results suggest that thermal coal exports in 2009–10 could be almost 80 per cent higher in 2009–10 than in the base case, while coking coal exports could be around 46 per cent higher.

Table L.11: **Scenario 3: impact on the black coal industry**

	Coking coal		*Thermal coal*	
	Average annual percentage change 1997–98 to 2009–10	*Percentage deviation from base case in 2009–10*	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case in 2009–10*
Export volume	5.0	46	7.3	78
Domestic sales volume	-1.6	0	1.5	30
Output volume	4.7	44	5.3	49
Employment (hours)	-4.2	12	-3.2	18
Real investment	-2.0	10	-1.0	14
Primary factor use per unit of output	-4.8	24	-5.2	24

Source: MONASH-Coal simulations.

With higher exports, output of both coking and thermal coal increases at a much higher rate than in the base case scenario — by 4.7 per cent a year for coking coal (compared with 1.6 per cent a year in the base case) and by 5.3 per cent a year for thermal coal (compared with 1.9 per cent in the base case).

Total industry employment (measured as the total number of labour hours), as in all the scenarios, is estimated to decline relative to current levels. But with comparatively rapid productivity change, and higher output and investment than in the base case, the rate of decline slows, so that total industry employment is estimated to be about 15 per cent higher in 2009–10 than in the base case. This suggests that there could be around 2500 more jobs in the industry in 2009–10 than in the base case.

With increased output, total royalty collections are estimated to be about $255 million higher in 2009–10 than in the base case.

L.5.2 Economy-wide effects

The estimated macroeconomic effects of accelerating productivity change in the black coal industry are summarised in Table L.12.

Table L.12: **Scenario 3: economy-wide impact**

Macro variables	*Percentage deviation from base case 2009–10*
Real GDP	0.4
Real investment	0.7
Real private consumption	0.9
Export volumes	0.2
Import volumes	1.0
Traditional exports	5.9
Employment (hours)	0.0
Real wage (producer)	0.6
Terms of trade	0.7
Competitiveness index	-1.5

Source: MONASH-Coal simulations.

Results suggest that rapid improvement in coal productivity could increase annual real GDP in 2009–10 by 0.4 per cent compared with the base case. Expressed in today's dollars, this would represent around $3 billion in 2009–10. Real private consumption is estimated to be 0.9 per cent higher and real investment 0.7 per cent higher than base case estimates for 2009–10.

As in Scenario 2, the estimated change in real private consumption is amplified by the assumption that the entire increase in GDP (adjusted for the income which accrues to foreigners from additional investment) is consumed by the private sector in the current period. However, while in Scenario 2 the terms of trade deteriorated because of induced expansion of traditional exports, in this scenario, the reverse is the case. Expansion of the black coal industry leads to relative contraction of other traditional export industries which, in turn, tends to raise world prices for some major commodities. This indirect effect increases the purchasing power of GDP and thus, increases real consumption further.

However, some of the increase in GDP will accrue to foreign owners of the existing capital stock, moderating the increase in real private consumption. This effect has not been modelled.

Economy-wide real wages also are estimated to be higher in 2009–10 than in the base case (by 0.6 per cent), while total employment is virtually unchanged at its base case level. This reflects the modelling assumption that aggregate employment growth, in the long run, is determined largely by institutional arrangements outside the scope of the model. This assumption is explained further in Appendix M.

If the increase in real wages were moderated, employment, real GDP and real consumption could be even higher. Nonetheless, the results as they stand, underscore the point that improved productivity generates additional income which can be distributed throughout the economy.

The real exchange rate is estimated to *appreciate* by 1.5 per cent. As explained in Box L.3, this indicates a *decline* in Australia's international competitiveness. While this might appear counter-intuitive in the context of significantly improved productivity in the black coal industry, real appreciation is an inevitable response to the increased export receipts and income flowing from improved productivity. Overall, the volume of trade (imports and exports) expands. This process is explained in Boxes L.4 and L.5.

L.5.3 Impact on other industries

Table L.13 summarises the estimated impact of accelerated productivity improvements in the Australian black coal industry on other industries. The results show that all sectors are likely to continue to grow relative to current production levels, though growth accelerates for some and slows slightly, for others.

Industries that expand relative to the base case (apart from the black coal industry) include construction, transport and storage, communications and finance. Industries whose growth rates slow somewhat (relative to growth in the base case) include agriculture, forestry and fishing, hospitality (which includes the export-oriented tourism industry) as well as several manufacturing industries that are exposed to strong international competitive pressures.

Boxes L.4 and L.5 explain the link between black coal industry expansion and the relative expansion or contraction of other industries. Briefly, expansion of the black coal industry requires both factor and intermediate inputs. Industries that compete with the black coal industry for factors of production, especially labour (capital can be obtained internationally), will tend to contract, particularly if their output prices are constrained by international competition. On the other hand, industries that supply inputs to the black coal industry, including capital goods and related services, benefit.

Table L.13: **Scenario 3: impact on real output of major industries**

	Industry sector	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case 2009–10*
1	Agriculture, forestry and fishing	2.7	-1.3
2	Mining (including coal)	3.8	12.1
	Black coal — coking	*4.7*	*44.0*
	Black coal — thermal	*5.3*	*49.3*
3	Food, beverages and tobacco	2.8	-1.1
4	Textiles, clothing, footwear	1.9	-1.4
5	Wood and furniture	2.8	0.0
6	Paper, paper products	3.6	-0.2
7	Chemicals	4.9	-0.8
8	Non-metallic construction	3.0	0.3
9	Basic metal products	3.8	-1.6
	Iron and steel	*1.2*	*0.0*
10	Transport equipment	4.3	-0.8
11	Electronic equipment	5.7	-1.1
12	Leather, rubber, etc.	3.9	-1.2
13	Electricity, gas and water	2.9	0.2
	Electricity	*3.2*	*0.4*
14	Construction	3.1	0.8
15	Wholesale and retail trade	2.8	0.3
16	Transport and storage	4.1	0.6
17	Communications	6.8	0.6
18	Finance, business services	5.6	0.5
19	Ownership of dwellings	2.9	0.6
20	Public administration	1.8	0.0
21	Health, education, welfare	2.9	0.2
22	Hospitality, etc.	3.8	-0.6

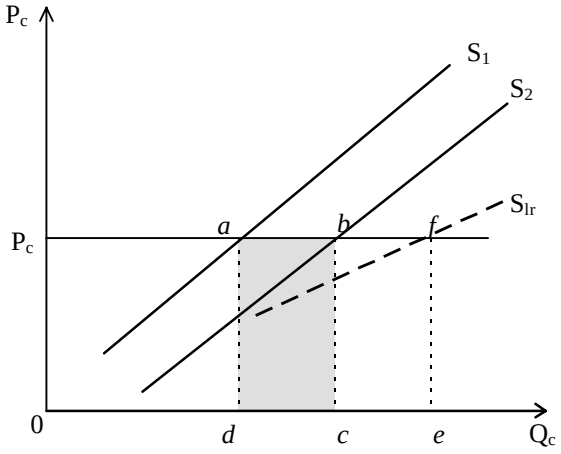
Source: MONASH-Coal simulations.

In addition, higher national income that flows from higher productivity (via increased export income — see Box L.4) encourages expansion of the non-traded services sector at the expense of trade-exposed industries. This shift

occurs as a result of real exchange rate appreciation, brought about by nominal exchange rate appreciation and/or higher domestic costs which result from increased export receipts. Real exchange rate appreciation makes the production of exports and import-competing goods less profitable, and the production of non-traded services more profitable.

Box L.4: **The impact of improved productivity on national income**

An improvement in productivity means that a given level of output can be produced with fewer inputs. Alternatively, more output can be produced with the same amount of inputs. The value of the additional output which can be produced (at the same total cost as before the productivity change) is the pure 'income' effect of the productivity change. It can be thought of as a productivity 'dividend'.[a] The process is illustrated below in a partial equilibrium, comparative static, framework (compared with MONASH which takes into account economy-wide effects over time).



Initially, the Australian black coal industry (short-run) export supply curve is S_1, with the quantity exported 0*d*, at price P_c. With a productivity improvement, as discussed above, costs fall. This is represented by a rightward shift of the short-run supply curve, say to S_2. If the price remains at P_c, the industry will expand production to the point where marginal cost equals price, which is represented by quantity 0*c*. Because this expansion in output and export sales is achieved without drawing resources from other activities in the economy, the entire increase in export receipts, represented by the rectangle *abcd* represents additional net income to the black coal industry, and to the economy. The extra income initially will accrue to coal mine owners and employees and to governments via higher tax receipts. To the extent that dividends are repatriated abroad, this will reduce the net income gain to the Australian community.

Box L.4: **The impact of improved productivity on national income** (continued)

Higher profits will also encourage additional investment in the industry. The resulting increase in capacity is shown by the new long-run supply curve S_{lr}. For price P_c, this implies additional exports (to 0*e*). But, because resources must be drawn into the industry from other parts of the economy in order to expand exports further, the gain to the black coal industry and the economy is smaller than the increase in coal export receipts.

The *net* gain is measured by additional export receipts (area *bcef*) *minus* the area under the long-run supply curve (S_{lr}), which measures the cost of industry expansion. This net gain which arises from more efficient deployment of resources in the economy following the productivity improvement in coal, is *additional* to the gain indicated by area *abcd*.

The analysis so far has assumed no change in the export price of coal. If the price falls as exports expand, both the pure income effect and incentive to expand will be dampened. The increase in income and the additional investment and employment in the industry will have repercussions for the rest of the economy. Those who receive the additional income (including the government) spend or invest it and the ensuing pattern of extra spending will affect the pattern of industry growth. In addition, as the black coal industry becomes a more attractive investment prospect, it will draw resources from other industries and their growth will be moderated.

Thus, while the economy gains overall, and some industries (as well as the black coal industry) gain, some will experience slower growth. (These linkages are explored in more detail in Box L.5) Can this crowding out of some other industries be prevented? The government, for example, could try to offset the additional spending by increasing taxes or reducing its expenditure. But this would have only short-term effects because higher government saving will tend to stimulate private investment in the economy. The driving force behind the restructuring is higher income and a more profitable, expanding black coal industry — the only way to eliminate or moderate the pressure for structural change is to eliminate or reduce the size of the productivity improvement. Even if black coal industry expansion were directly prevented, national income would still increase because resources 'saved' by the productivity improvement could shift to other industries, expanding their output.

a If the productivity improvement is the result of eradication of inefficient work practices, it is possible that workers and/or management incurred costs from their removal. If this is the case, strictly speaking, not all of the measured productivity gain is an income bonus. However, such costs are likely to be transitional whereas the augmentation of national income endures.

Box L.5: **Structural implications of black coal industry expansion**

When an industry (or industries) in the economy experiences significant export and output expansion, equilibrium in the economy is disturbed. Higher exports, all else constant, lead to an export surplus; output expansion leads to excess demand for factors of production.

The imbalances created in various markets will set in train price and quantity adjustments which, over time, will generate a new equilibrium (in the absence of further disturbances[a]).

Expansion of the black coal industry triggers two major channels of adjustment:

1. The impact of increased export receipts (demand effects);
2. Increased demand for labour, capital and inputs by the black coal industry (supply effects).

Demand effects

The initial increase in coal export receipts generates an export surplus which increases national income. Typically, this income 'bonus' will be spent on a combination of consumption and investment goods and services. To the extent this extra spending falls on non-traded goods and services (for example, financial services, construction, transport, entertainment), the prices of these services can rise (relative to the price of tradeables) which encourages additional supply, drawing resources from the tradeable goods sector.

Additional demand for goods and services that are traded internationally, and which face intense international competition, does not result in higher prices for these goods and services. Indeed, *relative* to the prices of non-traded goods, the price of tradeables (expressed in $A) falls. This relative price change is referred to as real exchange rate appreciation. Real appreciation thus increases domestic demand for tradeables but reduces their domestic supply— the net result is higher imports and lower exports.

As explained in Box L.3, the real exchange rate is the ratio of the price of tradeable goods (in $A) and the price of non-traded goods. It changes as a result of nominal exchange rate changes and/or price changes. Thus real appreciation can be brought about by nominal appreciation of the currency (which directly reduces the $A price of traded goods relative to non-traded goods) or an increase in domestic costs (which increases the price of non-traded goods relative to the price of tradeables), or some combination of the two. Whichever transmission mechanism operates, however, the ultimate real effect is the same — stronger growth of the non-traded goods sector and slower growth in the traded goods sector.

Box L.5: **Structural implications of black coal industry expansion** (continued)

Overall, the real appreciation leads to a reduction in *net* exports (exports *minus* imports) which balances the initial export surplus. The black coal industry will not be immune to the real appreciation — its expansion will be somewhat moderated, but overall, trade expands in the economy.

In Table L.13, which summarises the impact of coal expansion on major industries, it can be seen that relative to base case projections (non-traded) service sectors tend to expand while industries that are most exposed to international market forces, including agriculture and import-competing manufacturing industries, contract.

Supply effects

With the productivity improvement, the black coal industry can expand output using its existing level of inputs. With lower unit costs, and higher rates of return, coal producers have an incentive to invest and expand production still further. To do this they must employ more labour and capital.

Financial capital can be obtained from abroad without draining other sectors (although higher net capital inflow will augment the real appreciation effect described above), but labour must be obtained from other sectors of the economy. This tends to push up wages. Higher wages squeeze industries that must remain internationally competitive — import-competing and non-coal export industries. In other words, the demand effects which lead to contraction of the traded goods sector typically will be reinforced by supply effects.

The fortunes of some industries are tied closely to the black coal industry. Industries which supply inputs to coal will benefit from its expansion. Industries which use coal as a major intermediate input will gain if increased coal supply leads to lower prices.

Summary

Structural adjustment following black coal industry expansion is an inevitable consequence of that expansion. Importantly, the adjustment occurs in the context of, indeed to a large extent because of, higher national income. As a result of expansion of coal exports, output of agricultural and other mining industries grows more slowly. Growth of import-competing industries is similarly affected, while non-traded service industries experience stronger growth.

a What follows is a very brief and non-technical summary of what has become known as the 'Gregory thesis' or 'Dutch Disease'. Refinements and extensions are omitted here. The interested reader is referred to Corden (1984) and Cook and Sieper (1984) for excellent summaries of the large Australian literature.

L.5.4 Qualifications and sensitivity analysis

The results assume that there are no domestic impediments to realising expanded export potential. The MONASH-Coal model assumes that port and other transport and handling services respond to increased demand, but if there were significant impediments to increased services in some regions, for example, the estimated expansion could be moderated.

The results also abstract from any transitional adjustment costs incurred. Although under this high productivity growth scenario, job losses in the industry are estimated to slow down, change in work practices will inevitably involve adjustment costs. These transitional costs will moderate the extent of any gains estimated by the model. Nonetheless, such costs occur only in the short term, whereas the benefits of sustained improvements in productivity continue indefinitely.

Importantly, for reasons explained in Attachment L5, the results in Scenario 3 assume that thermal coal prices do not change significantly in response to changes in the level of Australian exports. Put another way, demand for Australian thermal coal is assumed to be highly responsive to changes in price (a 1 per cent fall/increase in its price is assumed to lead to a 20 per cent increase/decrease in quantity demanded, that is, the elasticity of demand is assumed to be -20). If Australian exports expand, a very small fall in thermal coal prices will be sufficient to induce a large expansion in demand for Australian exports.

Demand for Australian coking coal is assumed to be somewhat less responsive to price changes. As explained in Attachment L5, the elasticity of demand for coking coal is assumed to be -10. Thus, a 1 per cent fall/increase in price induces a 10 per cent expansion/contraction in the quantity demanded. The lower export demand elasticity reflects Australia's larger share of the world coking coal market.

Based on these assumptions about demand for Australian coking and thermal coal, an increase in export capacity by Australia broadly translates into increased exports and export income because export prices fall only slightly. If foreign demand were less responsive to changes in coal prices, prices would need to fall by a larger amount in order to encourage increased demand. Lower coal prices would also dampen Australia's export response. In other words, in this situation, an improvement in productivity would increase export *capacity* (for any export price), but the expansion in capacity would not be matched by an expansion in actual exports or export receipts.

In order to gauge the sensitivity of the results to changes in the export demand elasticities, Scenario 3 was re-run with elasticities of demand of -10 for thermal coal and -5 for coking coal. In other words, the responsiveness of foreign buyers to a change in the price of coal was halved. The results for the black coal industry under these market assumptions are presented in Table L.14.

Table L.14: **Scenario 3 (sensitivity analysis): impact on the black coal industry**

	Coking coal		*Thermal coal*	
	Average annual percentage change 1997–98 to 2009–10	*Percentage deviation from base case in 2009–10*	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case in 2009–10*
Export volume	4.1	32	6.2	58
Domestic sales volume	-1.6	0	1.5	2
Output volume	3.8	30	4.6	37
Employment (hours)	-5.4	-3	-4.2	4
Real investment	-2.8	22	-1.8	21
Primary factor use per unit of output	-4.8	-24	-5.1	-24

Source: MONASH-Coal simulations.

Export and output performance in the black coal industry is estimated to improve relative to the base case despite lower (albeit still elastic) export demand elasticities. Industry investment is also higher than in the base case, though the level of employment is virtually unchanged.

The economy overall gains — real GDP growth is estimated to be 0.38 per cent higher in 2009–10 than in the base case, just 0.05 per cent lower than the gain estimated in Scenario 3 with higher demand elasticities. Because of the effect of lower coal prices on the terms of trade, real private consumption is 0.6 per cent higher than base case projections, compared with 0.9 per cent in Scenario 3. In addition, because expansion of the black coal industry is moderated, real appreciation (or loss of competitiveness) is also less than in Scenario 3. This reduces the contractionary impact on other export and import-competing industries, and moderates the expansion of service industries.

The impact of lower export demand elasticities is also captured reasonably well by Scenario 4a which is discussed below. Results for that scenario similarly

indicate that gains are achievable for the black coal industry and the economy following productivity improvements even with an induced reduction in coal export prices.

On the whole, the Commission considers that international demand for black coal *is* sensitive to price changes. In other words, expansion of Australian exports is *not* expected to lead to large reductions in world coal prices which choke off that expansion. In particular, there is evidence that world market conditions are becoming increasingly competitive due to the emergence of new suppliers and markets, as well as recent developments in several Asian economies. On this basis, the Commission considers that Scenario 3 provides a reasonable representation of international market conditions.

L.6 Scenario 4a: accelerated productivity growth leading to lower coal prices

As explained above, the Commission considers that Scenario 3 provides a reasonable representation of the international market for coal, and thus provides a good indication of the potential effects of accelerated productivity improvements in the Australian black coal industry. However, there is a range of views about the influence of changes in the level of Australian coal exports on foreign demand and export prices. For example, one participant has argued that demand for Australian coal is totally unresponsive to price changes (see Chapter 2).

In this simulation, Scenario 3 is modified to illustrate a situation where foreign buyers are in a position to capture more of the benefit of the productivity improvement than would occur in competitive markets by negotiating a lower price for Australian coal. Specifically, in Scenario 4a, the black coal industry expands output using its existing labour and capital, but the lower price that results discourages further investment and expansion of the industry (relative to the base case). Moreover, without additional investment there is no additional employment generated relative to the base case.

As discussed in Chapter 2, the Commission considers that foreign buying strategies appear to be consistent with an objective of long-run cost minimisation, suggesting that, all else constant, price is indeed an important determinant of the quantity of Australian coal sold. In particular, new markets are emerging for Australian coal exports in India, the Republic of Korea, Taiwan and Europe, for example, thus reducing Australia's reliance on traditional markets.

Nonetheless, if, for example, coal buyers were to exhibit some degree of buying power in future, Scenario 4a provides a reasonable approximation of such behaviour. The modelling results indicate that there are still gains for the black coal industry, and the community overall, from cost reductions.

L.6.1 Impact on the black coal industry

The results for the black coal industry are summarised in Table L.15. Output and exports are still estimated to increase, but only to the extent that productivity gains allow increased output from existing inputs.

Table L.15: **Scenario 4a: impact on the black coal industry**

	Coking coal		*Thermal coal*	
	Average annual percentage change 1997–98 to 2009–10	*Percentage deviation from base case in 2009–10*	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case in 2009–10*
Export volume	4.1	32	5.7	49
Domestic sales volume	-1.6	0	1.4	1
Output volume	3.9	31	4.2	31
Employment (hours)	-5.2	0	-4.5	0
Real investment	-2.7	0	-2.1	0
Primary factor use per unit of output	-4.8	-24	-5.1	-24

Source: MONASH-Coal simulations.

Thermal coal exports are estimated to be about 50 per cent higher in 2009–10 than in the base case. Coking coal exports are estimated to be around 30 per cent higher in 2009–10 than in the base case. Employment and investment growth, for the reasons outlined above, are the same as in the base case. Royalty collections are estimated to be about $150 million higher in 2009–10 than in the base case.

L.6.2 Economy-wide effects

Table L.16 summarises the macroeconomic effects. Annual GDP and real consumption are both estimated to rise (relative to the base case) by 0.3 per cent and 0.5 per cent respectively, compared with increases of 0.4 per cent and

0.9 per cent (relative to the base case) in Scenario 3. As expected, lower coal prices moderate the extent of national income and consumption gains.

Table L.16: **Scenario 4a: economy-wide impact**

Macro variables	*Percentage deviation from base case 2009–10*
Real GDP	0.3
Real investment	0.4
Real private consumption	0.5
Export volumes	0.4
Import volumes	0.6
Traditional exports	4.3
Employment (hours)	0.0
Real wage (producer)	0.4
Terms of trade	0.2
Competitiveness index	-0.8

Source: MONASH-Coal simulations.

L.6.3 Impact on other industries

The implications for the structure of the economy are summarised in Table L.17. Because the black coal industry in this scenario does not draw resources from other sectors, the pressure for other industries to contract is eased. But higher export receipts and national income still lead to expansion of service industries at the expense of export and import-competing industries — the real exchange rate still appreciates albeit to a smaller extent.

Industries that use coal as a major input (the iron and steel industry in particular) benefit from lower coal prices.[2] Growth in some service sectors, including construction (which gained from black coal industry investment following the productivity growth modelled in Scenario 3), is moderated.

[2] This assumes that coal producers do not engage in price discrimination — that is, charge a higher price to domestic consumers than foreign buyers. If coal production is reasonably competitive, the price received by producers from exports and domestic sales will be broadly the same. This assumption is used in MONASH-Coal.

Table L.17: **Scenario 4a: impact on real output of major industries**

	Industry sector	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case 2009–10*
1	Agriculture, forestry and fishing	2.8	-0.8
2	Mining (including coal)	3.5	8.2
	Black coal — coking	*3.9*	*31.0*
	Black coal — thermal	*4.2*	*31.0*
3	Food, beverages and tobacco	2.9	-0.7
4	Textiles, clothing, footwear	2.0	-0.8
5	Wood and furniture	2.8	0.1
6	Paper, paper products	3.6	-0.1
7	Chemicals	4.9	-0.4
8	Non-metallic construction	3.0	0.2
9	Basic metal products	3.9	-0.8
	Iron and steel	*1.2*	*0.2*
10	Transport equipment	4.3	-0.4
11	Electronic equipment	5.8	-0.7
12	Leather, rubber, etc.	4.0	-0.7
13	Electricity, gas and water	2.9	0.2
	Electricity	*3.2*	*0.3*
14	Construction	3.1	0.5
15	Wholesale and retail trade	2.7	0.2
16	Transport and storage	4.1	0.5
17	Communications	6.8	0.4
18	Finance, business services	5.6	0.4
19	Ownership of dwellings	2.9	0.3
20	Public administration	1.8	0.0
21	Health, education, welfare	2.8	0.1
22	Hospitality, etc.	3.8	-0.3

Source: MONASH-Coal simulations.

L.7 Scenario 4b: accelerated productivity growth leading to significantly lower coal prices

This scenario is similar to Scenario 4a, but now it is assumed that buyers of Australian coal exports bargain down the price of coal by the *full* amount of the cost reductions assumed in Scenario 3.

In the Commission's view this is an unrealistic scenario as it implies that whatever the price of coal, high or low, the quantity demanded by overseas buyers will not change. The scenario has been modelled by CoPS to illustrate that, even under these extreme assumptions, real national income can increase as a result of more efficient resource use in the economy.

Not surprisingly, however, as shown by the results in Table L.18, potential gains for the black coal industry from accelerated productivity improvements are whittled away. Export volumes and output in 2009–10 are estimated to be virtually the same as in the base case, but lower coal prices translate into much lower export receipts.

Table L.18: **Scenario 4b: impact on the black coal industry**

	Coking coal		*Thermal coal*	
	Average annual percentage change 1997–98 to 2009–10	*Percentage deviation from base case in 2009–10*	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case in 2009–10*
Export volume	1.6	-1	2.4	2
Domestic sales volume	-1.6	1	1.3	0
Output volume	1.5	-1	2.0	1
Employment (hours)	-8.4	-35	-7.6	-32
Real investment	-4.6	-21	-3.8	-19
Primary factor use per unit of output	-4.8	-24	-5.1	-24

Source: MONASH-Coal simulations.

Black coal industry employees do not fare well in this scenario because the negative impact of assumed labour-saving productivity change on employment is not offset by increased output growth. As a result, black coal industry employment in 2009–10 is estimated to be around 30 per cent lower than in the base case.

Annual royalty revenue is estimated to be around $60 million lower in 2009–10 than in the base case.

L.7.1 Economy-wide effects

The economy-wide effects of much lower coal prices, coupled with large productivity improvements, are summarised in Table L.19. Real GDP is still expected to be higher than in the base case but the gain, as might be expected, is much lower. The estimated fall in the terms of trade which reflects the induced fall in coal prices, is estimated to eliminate gains for domestic consumers.

Table L.19: **Scenario 4b: economy-wide impact**

Macro variables	*Percentage deviation from base case 2009–10*
Real GDP	0.2
Real investment	-0.2
Real private consumption	0.0
Export volumes	1.2
Import volumes	0.1
Traditional exports	1.1
Employment (hours)	0.0
Real wage (producer)	0.1
Terms of trade	-0.9
Competitiveness index	0.2

Source: MONASH-Coal simulations.

Nonetheless, the aggregate results indicate that national output can grow, despite falling coal prices, because more efficient use of inputs by the black coal industry allows other industries to draw on resources formerly employed in that industry. As in all scenarios, however, transitional adjustment costs will moderate the extent of gains in the short term. These structural shifts are summarised in Table L.20.

L.7.2 Impact on other industries

Output in all major industry classifications (except for the construction industry) expands in this scenario. Poorer performance of the construction industry is due to lower investment in the economy and the black coal industry in particular. Industries that contracted due to strong expansion of the black coal

industry (in Scenarios 3 and, to a lesser extent, in Scenario 4a), the export and import-competing industries, now expand relative to the base case.

Table L.20: **Scenario 4b: impact on real output of major industries**

	Industry sector	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case 2009–10*
1	Agriculture, forestry and fishing	2.9	0.2
2	Mining (including coal)	3.1	3.0
	Black coal — coking	*1.5*	*-0.8*
	Black coal — thermal	*2.0*	*1.4*
3	Food, beverages and tobacco	3.0	0.2
4	Textiles, clothing, footwear	2.1	0.3
5	Wood and furniture	2.8	0.1
6	Paper, paper products	3.6	0.2
7	Chemicals	5.0	0.4
8	Non-metallic construction	3.0	0.1
9	Basic metal products	4.0	0.6
	Iron and steel	*1.2*	*0.7*
10	Transport equipment	4.4	0.3
11	Electronic equipment	5.9	0.5
12	Leather, rubber, etc.	4.1	0.5
13	Electricity, gas and water	2.9	0.2
	Electricity	*3.2*	*0.2*
14	Construction	3.0	-0.2
15	Wholesale and retail trade	2.7	0.1
16	Transport and storage	4.1	0.3
17	Communications	6.7	0.1
18	Finance, business services	5.6	0.2
19	Ownership of dwellings	2.9	0.1
20	Public administration	1.8	0.0
21	Health, education, welfare	2.8	0.0
22	Hospitality, etc.	3.8	0.1

Source: MONASH-Coal simulations.

These industries benefit from improvements in coal productivity because the black coal industry, whose response to the productivity change is constrained by falling coal prices, releases labour. In addition, there is a small real depreciation, or improvement in competitiveness, due to the fall in coal export income. Industries that use coal as an input, especially the iron and steel industry, also benefit from lower coal prices.

L.8 Scenario 5a: accelerated productivity change in coal and best practice productivity in rail transport of coal

In the base case it is assumed that rail charges are reduced gradually to remove all excess charges for rail freight of coal (that is, the price component exceeding cost) by 2005–06. This projection reflects announced policy to remove rail 'royalties' as well as the expected impact of national competition reforms under way in NSW and Queensland (see Chapters 7, 10 and Attachments L3, L6).

Scenario 5a assumes that further rail freight reductions occur as the result of improved productivity. Specifically, rail freight rates for coal are assumed to fall by 20 per cent relative to the base case, closing the estimated gap between current levels of operating efficiency and best practice. The improvement is assumed to occur over five years beginning in 1998–99, in tandem with accelerated productivity improvements in the mines (as modelled in Scenario 3). When fully implemented, the productivity improvement delivers a reduction in rail charges to the black coal industry of around $150 million per year.

L.8.1 Impact on the black coal industry

The modelling results are reported in Table L.21. The impact of lower rail costs for the black coal industry is positive. Exports, output, employment, and investment are all higher than if the black coal industry alone were to accelerate productivity growth.

For example, thermal coal exports in this scenario are estimated to be 92 per cent higher in 2009–10 relative to the base case, compared with 78 per cent in Scenario 3. Coking coal exports are estimated to be 53 per cent higher than in the base case, compared with 46 per cent in Scenario 3.

L.8.2 Economy-wide effects

Larger expansion of black coal industry exports and output, not surprisingly, generates additional economy-wide gains. National income is also boosted indirectly in this scenario by lower rail freight rates for other users of rail

services, especially agriculture and other mining industries. By 2009–10, GDP is estimated to be 0.6 per cent above the base case projection, compared with 0.4 per cent in Scenario 3. In other words, a 20 per cent reduction in rail costs to coal producers is estimated to generate an increase in national income of around 0.2 per cent.

Similarly, real investment, real private consumption and real wages are all estimated to be higher in this scenario than in Scenario 3, and significantly higher than in the base case (see Table L.22).

L.8.3 Impact on other industries

With expansion of the black coal industry larger than in Scenario 3, the impact on other industries is also more pronounced.

Appreciation of the real exchange rate, or loss of competitiveness, is stronger, reflecting larger income gains. The black coal industry's demand for labour is also higher than in Scenario 3. For the reasons explored in Boxes L.4 and L.5, relative to growth in the base case, these forces lead to slower growth in export and import-competing industries and relatively stronger growth in non-traded, service industries (see Table L.23). However, the impact of real exchange rate appreciation on agricultural and mining exporters is moderated by lower rail freight rates.

Table L.21: **Scenario 5a: impact on the black coal industry**

	Coking coal		*Thermal coal*	
	Average annual percentage change 1997–98 to 2009–10	*Percentage deviation from base case in 2009–10*	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case in 2009–10*
Export volume	5.4	53	7.9	92
Domestic sales volume	-1.6	0	1.6	4
Output volume	5.1	51	5.8	58
Employment (hours)	-3.8	19	-2.6	27
Real investment	-1.6	16	-0.5	21
Primary factor use per unit of output	-4.8	-24	-5.2	-24

Source: MONASH-Coal simulations.

Table L.22: **Scenario 5a: economy-wide impact**

Macro variables	*Percentage deviation from base case 2009–10*
Real GDP	0.6
Real investment	0.9
Real private consumption	1.0
Export volumes	0.2
Import volumes	1.2
Traditional exports	7.0
Employment (hours)	0.0
Real wage (producer)	0.7
Terms of trade	0.8
Competitiveness index	-1.7

Source: MONASH-Coal simulations.

L.9 Scenario 5b: accelerated productivity change in coal and accelerated reductions in excess rail freight charges

Scenario 5b assumes that excess or monopoly charges for rail freight of coal, that is, charges (excluding rail royalties) in excess of the cost of providing rail services, are removed by 2001–02. (As with Scenario 5a, rail freight reductions have been modelled along with productivity improvements at the mine.)

In the base case, it is assumed that these excess charges are removed by 2005–06, reflecting the impact of reforms already under way. However, as discussed in Chapter 7, the Commission considers that there is scope both to hasten and to deepen the reform process in NSW and Queensland.

It is difficult to quantify excess freight charges due to difficulties in estimating costs (see Chapter 7, Section 7.6). For reasons explained in Attachment L6, the Commission has assumed that, on average, excess freight charges (excluding rail ‘royalties’) currently are around $2/tonne of coal railed.

Table L.23: **Scenario 5a: impact on real output of major industries**

	Industry sector	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case 2009–10*
1	Agriculture, forestry and fishing	2.7	-1.3
2	Mining (including coal)	4.0	14.1
	Black coal — coking	*5.1*	*51.0*
	Black coal — thermal	*5.8*	*57.9*
3	Food, beverages and tobacco	2.8	-1.3
4	Textiles, clothing, footwear	1.9	-1.6
5	Wood and furniture	2.8	0.0
6	Paper, paper products	3.6	-0.2
7	Chemicals	4.9	-1.0
8	Non-metallic construction	3.0	0.4
9	Basic metal products	3.8	-1.9
	Iron and steel	*1.2*	*-0.1*
10	Transport equipment	4.2	-1.0
11	Electronic equipment	5.7	-1.4
12	Leather, rubber, etc.	3.9	-1.5
13	Electricity, gas and water	2.9	0.2
	Electricity	*3.2*	*0.4*
14	Construction	3.1	1.0
15	Wholesale and retail trade	2.8	0.4
16	Transport and storage	4.1	0.5
17	Communications	6.8	0.7
18	Finance, business services	5.6	0.5
19	Ownership of dwellings	2.9	0.7
20	Public administration	1.8	0.0
21	Health, education, welfare	2.9	0.2
22	Hospitality, etc.	3.8	-0.7

Source: MONASH-Coal simulations.

L.9.1 Impact on the black coal industry

In Scenario 5b it is assumed that removal of the $2/tonne excess charge is achieved by 2001–02, four years earlier than in the base case. This represents a one-off benefit for the coal industry compared with the base case. Nonetheless, the results indicate that, in cumulative terms, additional thermal and coking coal exports of around 10 million tonnes, with a value of around $500 million, could be achieved between 1999–2000 and 2005–06.

There would be scope for further rail freight reductions if excess rail charges were not reduced to the extent assumed in the base case. For example, if it were assumed in the base case that monopoly rents did not phase to zero by 2005–06, but remained at around $2/tonne for the entire period modelled, the gains to the coal industry from their early removal would be larger than estimated in Scenario 5b. Indeed, if this were the case, the benefits to the industry would be around twice the level estimated in Scenario 5a above (which models a rail freight rate reduction of around $1/tonne). In other words, if rail freight rates were assumed to be around $2/tonne lower than in each year of the base case, coal exports could be around 20 per cent higher in 2009–10 than otherwise.

L.9.2 Economy-wide effects

For the economy as a whole there are virtually no additional gains under this scenario compared with Scenario 3 which models productivity gains in coal mines. The economy-wide results are thus the same as for Scenario 3 (see Table L.12). This occurs because the assumed reduction in rail freight rates (which is not due to productivity improvements) is modelled as a revenue-neutral tax change. This approach is required to reflect the fact that forgone ‘monopoly’ rail revenue must be made up by the government sector either by increasing taxes or by reducing expenditure. As modelled, monopoly rail revenue forgone is assumed to be balanced by an increase in income tax.

L.9.3 Impact on other industries

Due to induced expansion of the black coal industry and black coal exports, there is a small real appreciation effect (the competitiveness index is estimated to be 0.02 per cent below the base case projection in 2009–10) which leads to a negligible contraction of import-competing and export industries. Because the changes are so small (only affecting industry output growth estimates at the second-decimal place) they are not reported.

Table L.24: **Scenario 5b: impact on the black coal industry**

	Coking coal		*Thermal coal*	
	Average annual percentage change 1997–98 to 2009–10	*Percentage deviation from base case in 2009–10*	*Average annual percentage change 1997–98 to 2009–10*	*Percentage deviation from base case in 2009–10*
Export volume	5.0	46	7.4	80
Domestic sales volume	-1.6	0	1.5	3
Output volume	4.7	44	5.3	50
Employment (hours)	-4.2	12	-3.0	20
Real investment	-1.9	10	-0.9	16
Primary factor use per unit of output	-4.8	-24	-5.2	-24

Source: MONASH-Coal simulations.

L.10 State and Territory results

CoPS has disaggregated the results presented in Scenario 3 to show the impact of productivity improvements by State. Table L.25 reports the impact of accelerated productivity change in the black coal industry (Scenario 3) and productivity deterioration (Scenario 2) on employment and output by State. More detailed discussion of these regional effects is provided in Attachment L7.

Not surprisingly, relative to base case projections, NSW and Queensland benefit from expansion of the sector, while States which are export-oriented, Western Australia in particular, are estimated to experience somewhat slower growth. Conversely, if the coal sector contracts, NSW and Queensland are adversely affected, while other States perform slightly better.

Table L.25: **Output and employment by State and Territory in the base case, Scenario 2 and Scenario 3** (average annual percentage change 1997–98 to 2009–10)

	Base case	*Scenario 2*	*Scenario 3*
Real Gross State Product			
NSW	2.85	2.79	2.92
Vic	2.62	2.64	2.61
Qld	3.56	3.44	3.71
SA	2.64	2.65	2.63
WA	3.59	3.63	3.53
Tas	2.32	2.34	2.30
ACT	3.19	3.17	3.22
NT	3.95	3.99	3.89
Employment (hours)			
NSW	1.63	1.60	1.65
Vic	1.48	1.50	1.47
Qld	2.37	2.33	2.42
SA	1.52	1.54	1.51
WA	2.32	2.35	2.27
Tas	1.23	1.24	1.20
ACT	2.11	2.11	2.12
NT	2.62	2.64	2.59

Source: MONASH-Coal simulations.

L.11 Summary

The modelling results under the various scenarios highlight the important contribution of the black coal industry to the economy, as well as the extent (and implications) of the industry's exposure to international competition. Confirming intuition, the modelling indicates that under reasonable assumptions about world markets, (and conservative assumptions about aggregate employment), productivity improvements can benefit the black coal industry and the community at large. Table L.26 summarises estimated export, output and employment outcomes for the black coal industry, relative to current levels, under each scenario. These conclusions are conditioned by a wide array of base

case projections. Should these (especially for exports) prove too optimistic, or pessimistic, this would not undermine the story captured in Table L.26.

Table L.27 summarises the estimated impact on real GDP, real private consumption, real investment and economy-wide real wages in each scenario. The black coal industry and its employees generally gain from productivity growth in the industry where such improvements encourage higher output and investment. Only if productivity improvements directly induce a large fall in the coal export price (as in Scenario 4b), is employment estimated to fall significantly relative to the base case.

In all the scenarios modelled, GDP is estimated to increase as the result of productivity improvements. However, if coal prices fall by the full amount of cost reductions (as in Scenario 4b), the modelling suggests that an induced decline in the terms of trade could eliminate gains in real private consumption.

Under the accelerated productivity scenario (Scenario 3), GDP is estimated to be 0.4 per cent higher in 2009–10 than it would be with trend productivity growth. A gain in real GDP of that order would be worth around $3 billion in 2009–10 (in terms of today's dollars). Even if significant falls in coal prices are assumed (Scenario 4b), GDP can increase because other industries in the economy benefit from more efficient resource use by the black coal industry. Conversely, with no further productivity improvements after 1997–98, GDP in 2009–10 is estimated to be 0.3 per cent *lower* than in Scenario 1.

Under the assumptions of the model, the gains and losses in GDP under the different productivity assumptions translate into gains and losses in consumer welfare, as measured by real private consumption. However, the impact of induced changes in the terms of trade on the purchasing power of income also affects estimates of real private consumption.

The more rapidly the black coal industry improves its productivity and expands exports and output, the more pronounced will be the impact on other industries in the economy. This restructuring occurs in the context of, and largely as a result of, increased national income. It should also be noted that modelling has been conducted specifically to illustrate the potential effects of substantial productivity improvements in the black coal industry. It ignores the scope for large productivity improvements (over and above the rates which are incorporated in the base case) in other parts of the economy. To the extent that other industries accelerate their productivity growth, another set of structural adjustments would ensue.

Table L.26: **Performance of the coal industry 1997–98 to 2009–10 under Scenarios 1 to 5**

	Thermal coal			*Coking coal*		
	Export volume	*Output volume*	*Employ-ment (hours)*	*Export volume*	*Output volume*	*Employ-ment (hours)*
	Percentage change 1997–98 to 2009–10					
Steady productivity (Scenario 1)	+30	+24	-44	+23	+21	-47
No productivity change (Scenario 2)	-52	-37	-54	-22	-22	-54
Accelerated productivity (Scenario 3)	+130	+84	-33	+80	+73	-40
Accelerated productivity, moderately lower coal prices (Scenario 4a)	+92	+62	-44	+62	+58	-47
Accelerated productivity, significantly lower coal prices (Scenario 4b)	+33	+25	-62	+21	+20	-65
Accelerated productivity in coal and rail (Scenario 5a)	+146	+95	-28	+88	+82	-37
Accelerated productivity in coal; early removal of excess rail charges (Scenario 5b)	+134	+86	-33	+80	+74	-40

Source: MONASH-Coal simulations.

Under the assumptions used, Australian workers receive a large part of any income gain as higher real wages. In the long run, aggregate employment is assumed not to respond to productivity improvements, though there are employment gains in the short run, explained in Appendix M. But with permanent changes in productivity, lasting increases in employment could be achieved if the increase in real wages which flows from productivity change is moderated somewhat. The main point remains, however, that with significant productivity improvements in the black coal industry, there are potentially substantial national gains available for distribution throughout the community.

Table L.27: **Economy-wide impact of Scenarios 1 to 5** (percentage deviations from base case 2009–10)

	Real GDP	*Real private consumption*	*Real investment*	*Real wage*
Steady productivity growth (Scenario 1)	0	0	0	0
No further productivity growth (Scenario 2)	-0.3	-0.7	-0.6	-0.3
Accelerated productivity change (Scenario 3)	0.4	0.9	0.7	0.6
Accelerated productivity change and moderately lower coal prices (Scenario 4a)	0.3	0.5	0.4	0.4
Accelerated productivity change and significantly lower coal prices (Scenario 4b)	0.2	0.0	-0.2	0.1
Accelerated productivity in coal and rail (Scenario 5a)	0.6	1.0	0.9	0.7
Accelerated productivity in coal; early removal of excess rail charges (Scenario 5b)	0.4	0.9	0.7	0.6

Source: MONASH-Coal simulations.

L1 COAL EXPORT PROJECTIONS

This attachment details and explains the coal export volume and export price projections used in the base case simulation of the MONASH-Coal model. These projections have implications for productivity changes in the base case and for each of the scenarios. These are discussed in Attachment L4.

L1.1 Export volumes

Table L1.1 contains annual projections for coking and thermal coal export volumes used in the base case (Scenario 1). These estimates are based primarily on ABARE forecasts of world coal demand and supply and of Australia's capacity to respond. The projections for thermal coal exports link ABARE medium-term forecasts for the years 1997–98 to 2002–03 to various long-term forecasts for the years 2003–4 to 2009–10. Base case projections for coking coal combine ABARE forecasts for the years 1997–98 to 2002–03 with conservative projections of growth for the period 2003–04 to 2009–10. The basis for the projections is discussed below.

Thermal coal

ABARE (1998a) medium-term forecasts were combined with ABARE's relatively conservative February Quarter (1997) long-term forecasts (ABARE 1997a). The results were compared with those of the US Energy Information Administration (EIA 1997). Table L1.1 summarises the export volume projections used in the base case simulation in MONASH-Coal.

According to ABARE (1997b and 1998a), the world market for thermal coal is expected to grow relatively strongly because of the growing demand for energy in Asia, and because coal is a relatively low cost fuel and coal-fired power technologies are well established. But with the recent currency and asset price devaluations in Asia, the growth in the demand for energy is likely to be more subdued. This will be reflected in a slow-down in the growth of Australian thermal coal exports in the medium term. More efficient use of coal in electricity generation (which is already evident in Japan) could further moderate export demand. In the longer term, the cost competitiveness of coal-fired power stations and the increasing demand for energy in developing countries suggest that developing countries will find it easier to finance new power projects.

Table L1.1: **Projections of Australian exports of thermal and coking coal** (Mt)

Year	*Thermal*	*Coking*[a]
1997–98	74.2	82.6
1998–99	75.4	84.1
1999–00	79.3	86.9
2000–01	83.0	89.6
2001–02	86.1	91.7
2002–03	88.4	93.9
2003–04	90.1	95.5
2004–05	91.2	96.5
2005–06	92.3	97.4
2006–07	93.4	98.4
2007–08	94.5	99.4
2008–09	95.6	100.4
2009–10	96.8	101.4
Average annual % change	**2.2**	**1.7**

a ABARE forecasts treat coking and non-coking metallurgical coals as a single category.
Source: Commission estimates.

Thermal coal is an abundant resource and the efficiency with which it is extracted, prepared and transported is improving constantly. Over the medium and long term, the outlook is for continued strong competition from low-cost suppliers in Indonesia, South Africa, Venezuela, Colombia and China.

Australia is expected to increase its share of world thermal coal trade from 22 per cent in 1996 to 23 per cent in 2003 (ABARE 1998a). However, achieving these export volumes (at lower real export prices, as discussed below) requires that Australian producers at least maintain their competitive position relative to other suppliers. The implications of this assumption for the local coal industry and its employees are discussed in Attachment L4.

Coking coal

The Commission used ABARE (1998a) medium term forecasts for coking coal exports for the period until 2002–03 and conservative growth estimates from ABARE (1997a) and EIA (1997) for the period 2003–04 to 2009–10.

ABARE (1997b and 1998a) forecasts that the world coking market will grow relatively slowly in the medium-term. This reflects slow growth in blast furnace steel production worldwide. Most growth in blast furnace steel production is likely to be in developing countries. Another reason for the relatively slow growth of coking coal exports to developed country markets is the widespread adoption of electric arc furnace technologies. These do not use coking coal directly but may use thermal coal indirectly through electricity consumption.

Pulverised coal injection (PCI) coals are weak coking coals or thermal coals that have no coking properties. Their consumption is expected to grow relative to coking coal consumption. Since PCI coals have been classified as coking coals in the export forecasts (Table L1.1), the substitution from coking coals to PCI coals is captured within the coking coal forecasts. ABARE estimates that 1 tonne of PCI coal can be substituted for around 1.4 tonnes of coking coal (ABARE 1998a).

The medium and long term impacts of the Asian currency devaluations are likely to be similar to those for thermal coal. Australian exports of coking coal seem likely to grow slightly. This reflects Australia's dominant supplier status in the regional coking coal market, a position which is unlikely to be threatened in the foreseeable future.

L1.2 Export prices

The base case projections for prices of thermal and coking coal faced by Australian exporters in nominal and real terms are set out in Table L1.2. Nominal projections are based on ABARE forecasts. They are deflated using a projection of the GDP deflator from MONASH-Coal.

While $US coal prices have fallen significantly in recent months, Australian coal producers have been shielded to some extent by depreciation of the $A against the $US. Thus the Australian dollar prices assumed in the base case are consistent with prices currently being received by Australian coal producers.

ABARE price projections (1998a) are used in the base case until 2002–03 and conservative estimates of price changes thereafter. Over the medium term, the weakened demand for thermal coal, the strong competition in the thermal coal market and the competition from alternative fuels used in electricity generation, should continue to depress thermal coal nominal prices. In the longer term, thermal coal nominal prices may strengthen as a result of strengthening demand for electricity in Asia. Thermal coal real prices are expected to continue to decline.

Table L1.2: **Nominal and real base case price projections for thermal and coking coal 1997–98 to 2009–10**

	Thermal		*Coking*		
Year	*nominal*	*real*	*nominal*	*real*	*nominal exchange rate*[a]
	$A/tonne	*$A/tonne*	*$A/tonne*	*$A/tonne*	*$A/$US*
1997–98	48.44	41.60	67.43	57.91	0.680
1998–99	45.50	37.75	64.98	53.91	0.684
1999–00	46.62	37.66	65.97	53.30	0.700
2000–01	45.71	35.68	65.25	50.93	0.710
2001–02	45.22	34.14	65.06	49.11	0.724
2002–03	44.83	32.79	64.54	47.21	0.730
2003–04	46.05	32.67	65.18	46.25	0.730
2004–05	47.30	32.55	65.84	45.31	0.730
2005–06	48.59	32.43	66.49	44.38	0.730
2006–07	49.91	32.34	67.16	43.52	0.730
2007–08	51.27	32.26	67.83	42.68	0.730
2008–09	52.67	32.20	68.51	41.89	0.730
2009–10	54.10	32.15	69.19	41.12	0.730
Annual % change	**0.9**	**-2.0**	**0.2**	**-2.6**	**na**

na Not applicable.
a $A/$US nominal exchange rate based on ABARE estimates.
Sources: Commission estimates based on ABARE (1998a), EIA (1997) and the IEA (1997).

Coking coal price projections in the base case use ABARE (1998a) estimates until 2002–03 and very conservative projections from ABARE (1997b) and the International Energy Agency (IEA) (1997) for the long term. Coking coal nominal prices are expected to remain relatively flat over the medium and long term, despite the shortage of high quality coking coals in the medium term. This is because of the expected uptake by the world steel industry of new technologies and the slower growth in some Asian economies. Real coking coal prices are expected to fall over the projection period.

L2 ELECTRICITY AND STEEL PROJECTIONS

L2.1 Domestic electricity generation trends

Approximately 80 per cent of Australian black coal used domestically is consumed by the electricity generating industry. This industry is, therefore, an important determinant of the outlook for black coal producers selling in the domestic market. A number of changes in the electricity generating industry have the potential to affect the Australian black coal industry. A substantial proportion of new generating capacity is likely to be gas-fired, although coal will continue to be the dominant fuel input in electricity generation, especially in generating baseload power.

Natural gas as a substitute

One change in electricity generation affecting the coal industry is the ability of electricity generators to substitute to gas as a fuel input. This is governed by construction and generation costs as well as the availability and reliability of gas supply.

Coal-fired plants have a much larger minimum efficient scale than gas turbines (GTs) and often produce lower thermal efficiencies (Table L2.1). Therefore, gas generation can be installed in smaller increments in capacity and brought on line more quickly than black coal-fired electricity generation. Gas, therefore, may be able to take advantage of some emerging opportunities.

Table L2.1: **Approximate scale and efficiency of generating technologies, 1998**

Generating technology	*Capacity range*	*Thermal efficiency*
	MW	*%*
Integrated gasification combined cycle	300–1000+	45–48
Combined cycle gas turbine	100–2000+	57–58
Coal-fired	600–2000+	38–40

Source: ABARE 1998a.

Despite considerably lower operating costs for coal-fired plants (Table L2.2), new entrants are preferring to invest in new gas-fired power stations. This, in

part, reflects anticipated greenhouse gas emission constraints following the recent agreement signed at the Third Conference of Parties to the UN Framework Convention on Climate Change (the 'Kyoto summit'). However, technological developments have meant that some coal-fired plants can now provide intermediate load power, previously the domain of gas-fired plants.[1]

Table L2.2: **Relative capital and operating costs of different generation plant, 1994**

Generating unit	*Total capital cost*	*Short run marginal cost*
	$ per kW	*$ per MWh*
Black coal-fired	1200	9–15
Gas turbines	500–600[a]	25–40[b]
Hydro	2000	20–30

a The capital cost of oil-fired gas turbines is $500/kW; for gas-fired it is $600/kW.

b The marginal cost for baseload combined-cycle gas turbines is $25–30/Mwh, while for peaking turbines it is $35–40/MWh.

Source: IC 1995a.

The ability of natural gas to substitute for coal in electricity generation also depends on its availability. Total known recoverable reserves of Australian natural gas are approximately 100 000 petajoules (PJ) (AGA 1996). If all of Australia's electricity was generated from these reserves, they would be depleted in a little over six years, based on current electricity consumption of 16 000 PJ a year (and would require the construction of a pipeline from western oilfields to eastern power stations).

The National Electricity Market

Another change in the electricity generating industry that could affect the black coal industry is the introduction of the National Electricity Market (NEM) and the subsequent ability of Victorian brown coal-fired electricity to substitute for NSW black coal-fired electricity.

It is expected that more competitive supply arrangements in, and pricing of, electricity will reduce the need for excess capacity. ACIL Economics and Policy (1997b) argues that low (variable) cost brown coal-fired electricity will displace black coal fired-generation during periods of lower demand. Particularly between midnight and 6am when pool prices in the NEM will be low, an excess

[1] However, based on current and projected capital costs and running costs of coal and gas-fired plant, gas probably will remain the main input into peak load and a large part of intermediate power generation.

of baseload generation may be expected to result in an inability of NSW to be dispatched ('fired-up'). According to ACIL (1997b):

> Black coal suppliers interested in competing against Victorian brown coal (in overnight power markets) will be obliged to consider innovative, flexible, (lower) coal pricing for 'midnight coal'. This price pressure may be required simply to defend existing market shares, and would certainly be intensified if the capacity of the interconnection between NSW and Victoria were to be increased. (p. 15).

However, a number of factors limit the export of Victorian brown coal-fired electricity into NSW. According to ACIL, it is unlikely that new brown coal-fired plants will be installed. It is likely that increasing Victorian electricity demand will constrain power available for export to other States. While brown coal-fired plants could supply at low marginal cost, in peak demand there may be little capacity available to take market share from NSW generators. In fact, ACIL (1997b) has estimated that, from 1999, NSW generators will be net exporters into Victoria (noting that Victorian generators are exporting into South Australia).

Although initial regulatory limitations on electricity trading between NSW and Victoria were removed in July 1997, the interconnection linking State electricity grids is of relatively modest capacity. The current capacity from Victoria to NSW represents approximately 10 per cent of typical peak demand in NSW, although this will vary considerably depending on temperature and systems conditions (Transgrid & VPX, undated).

In 1993–94, Victoria exported 385 GWh of electricity to NSW. Victorian exports to NSW amounted to less than 1 per cent of both total Victorian electricity generated and total NSW electricity consumed. However, Pacific Power has noted that since May 1997, Victorian generators have exported the equivalent of approximately 10 per cent of NSW annual output (sub. 39). The capital cost of upgrading the NSW-Victorian interconnection by 400 MW (4 per cent of NSW peak demand) is estimated at $40 million (IC 1995a) which is an additional constraint to transmission capacity.

Projections

ABARE (1997g) projects the sectoral pattern of energy consumption to remain broadly similar to that of the past two decades, with electricity generation maintaining its share of total energy consumption over the period (around 26 per cent). In the MONASH-Coal base case projections, electricity output grows slightly faster than the economy as a whole, due to high growth prospects for electricity-intensive industries such as basic metal products.

However, changes in the pattern of fuel consumption are expected within the electricity generating sector. ABARE (1997g) expects coal to continue to be the major fuel used in electricity generation. However, the role of natural gas is forecast to increase substantially, with black coal expected to lose market share. By 2009–10, natural gas is projected to account for 21 per cent of fuel inputs for thermal electricity generation, compared with 9 per cent in 1995–96.[2] Black coal's share is expected to fall from 59 per cent to 52 per cent over the same period, despite over 1 per cent average annual growth in the volume of thermal coal used in electricity generation (Table L2.3).[3]

Table L2.3: **Projected fuel input volumes for thermal electricity generation in Australia, 1995–96 to 2009–10**

Fuel		*1995–96*	*1999–2000*	*2004–05*	*2009–10*
Black coal	1995–96=100	100.0	102.2	106.9	114.5
	Share of total (%)	58.9	53.6	51.4	52.2
Brown coal	1995–96=100	100.0	106.6	107.0	106.8
	Share of total (%)	30.2	28.6	26.3	25.0
Natural gas	1995–96=100	100.0	206.5	282.6	306.5
	Share of total (%)	8.8	16.2	20.4	21.0
Petroleum	1995–96=100	100.0	80.7	109.8	109.5
	Share of total (%)	2.1	1.5	1.9	1.8
Total	**1995–96=100**	**100.0**	**112.3**	**122.5**	**129.0**

Source: Commission estimates based on ABARE 1997g.

The increase in the share of natural gas used to generate electricity reflects the expectation that a substantial proportion of *new* electricity generating capacity will be gas-fired (ABARE 1997g). These projections rely on assumptions based, in part, on factors such as the environmental advantages of natural gas; lower

2 Since at least 1993, ABARE has revised upward its forecasts for natural gas use in thermal electricity generation. In 1995, ABARE forecast natural gas use in thermal electricity to be 14 per cent by 2009–10.

3 ABARE does not present explicitly the assumptions upon which these forecasts are based. The forecasts are based on information collected in a biennial fuel and electricity survey of energy users (as well as other available information, including that from energy suppliers). The projections are therefore based implicitly on fuel consumers' own expectations about factors which will influence their energy use, such as greenhouse gas emission targets. These forecasts were published before the Third Conference of Parties to the UN Framework Convention on Climate Change.

set-up costs, shorter lead times and higher efficiencies for gas-fired generating plant; and electricity market reforms.

In the base case, electricity generation output is expected to grow at an average of 3.1 per cent each year (Table L2.4). At the same time, domestic sales of thermal black coal are projected to grow by only 1.3 per cent a year. This difference reflects the issues discussed above. That is, changes in the domestic economy will lead to a decrease in the domestic demand for coal per unit of electricity output.

Table L2.4: **Base case projections for electricity generation**

Year	*Australian electricity generation, annual percentage growth rates*
1998–99	4.5
1999–00	3.5
2000–01	2.8
2001–02	2.7
2002–03	4.0
2003–04	3.5
2004–05	2.1
2005–06	3.1
2006–07	2.6
2007–08	3.0
2008–09	3.0
2009–10	3.0
Average annual growth, 1998–99 to 2009–10	**3.1**

Sources: ABARE (unpublished data) and MONASH-Coal model.

L2.2 International electricity generation

Over 50 per cent of the total value of Australian thermal coal production is exported. Therefore, developments in electricity generation in foreign markets will have a significant impact on the Australian black coal industry. World electricity production is expected to almost double by the year 2020 (ABARE 1998a). The International Energy Agency (IEA) projects rapid growth in non-OECD electricity consumption — at an annual average rate in excess of 5 per cent over the period to 2010. OECD electricity consumption is expected to grow at around 2 per cent per year over the same period. Coal is expected to

remain the major fuel input, with world coal-fired power generation expected to grow at an average annual rate of 3 per cent (Table L2.5).[4]

Table L2.5 **Projected fuel input volumes for world electricity generating capacity, 1995 and 2020**

Fuel	*Installed capacity 1995*	*Predicted capacity 2020*	*Average annual growth*
	GW	*GW*	*%*
Coal	870	1836	3.0
Gas	435	1296	4.5
Oil	435	648	1.6
Hydro	667	1026	1.7
Nuclear	348	378	0.3
Other	145	216	1.6
Total	**2900**	**5400**	**2.5**

Source: ABARE 1998a.

ABARE's forecast for Australian exports of black coal (see Attachment L1) assumes that industrial production growth in Asian countries will result in increased thermal coal consumption in electricity generation. In recent years, demand in Asia for reliable supply of competitively priced electricity has been strong and growing. ABARE forecasts electricity consumption in the Asian region to grow by around 5.3 per cent per year (ABARE 1997a). The recent financial crises in some Asian economies may slow this demand growth over part of the projection period.

Power generation systems in Japan, China and south Asia are dominated by coal. While the IEA (1997) expects this to continue to be the case, restructuring and deregulation of the power generation sector combined with increasing prevalence of private capital may promote the use of gas in many regions. As in the Australian market, increased competition in electricity generation and distribution will place downward pressure on thermal coal prices.

Over half of Australia's thermal coal exports are to Japan, most of which is used in electricity generation. However, diversifying away from coal as an energy source may be difficult in Japan given that natural gas requires the construction of expensive import handling facilities and sites for nuclear power are difficult

[4] These forecasts were published before the Third Conference of Parties to the UN Framework Convention on Climate Change, at which an international agreement on greenhouse gas reductions was signed.

to find and lack public acceptance. In 1996 alone, a number of new Japanese coal-fired power stations came on line and coal used by Japanese public and independent power producers grew 7.1 per cent that year.

The Republic of Korea and Taiwan are other major destinations for Australian thermal coal. The IEA (1997) expects these countries and Japan to have new coal-fired power stations in operation by 1999 that will increase their total capacity by 38 per cent (assuming no power station closures). An acceleration in the construction of independent power projects is expected in Asia, with many expected to be coal-fired power stations (ABARE 1998a).

Unlike in Australia, it is therefore expected that the share of coal in Asia's fuel mix will increase over the medium term. The high relative cost and the less certain supply of gas is expected to constrain the competitiveness of gas-fired power stations (IEA 1994, IEA 1997 and ABARE 1998a). The IEA expects Japanese electricity generation to grow at an average rate of 1.3 per cent per year to 2010, with that generated from coal to grow at the same rate (IEA 1997). These factors will affect Australian exports of thermal coal. Details of coal export projections are contained in Attachment L1.

L2.3 Domestic steel production

Almost all coking coal is transformed into coke and used in blast furnaces for the production of pig-iron which is subsequently converted to steel. Hence, the demand for coking coal is derived from the demand for steel. However, technological developments in steel production that by-pass the blast furnace, such as electric arc furnaces (EAF), and more efficient blast furnace use of coal, through the introduction of pulverised coal injection (PCI) technology, can be expected to weaken the relationship between steel and coking coal demand.

Australian steel production is estimated to have declined marginally in 1996–97. In the immediate future, the decision to close blast furnaces in Newcastle in 1999 will be partly offset by the upgrading of Port Kembla and Rooty Hill steel making capacity. However, expanded EAF capacity focussed on providing steel to the domestic market may reduce local opportunities for black coal in steel production (ABARE 1997a and 1997b).

ABARE expects the volume of Australian steel production to fall on average by approximately 1 per cent per year to 2003 (ABARE 1998a). However, a change in the composition of steel exports toward higher value-added products is expected to increase the value of steel production. MONASH-Coal base case forecasts incorporate growth in domestic steel production averaging 1.2 per cent per year over the period to 2010 (see Table L2.6). Domestic sales of coking coal

are projected, in the base case, to fall by 1.6 per cent a year, reflecting increased use of EAF and PCI technology.

However, domestic steel production accounts for only 7 per cent of the value of coking coal output; the remainder is exported. Therefore, developments in foreign steel industries will have a greater effect on the Australian coking coal industry.

Table L2.6: **Base case projections for steel production**

Year	*Australian steel production projections, annual percentage growth rates*
1998–99	5.0
1999–00	-14.1
2000–01	0.5
2001–02	-5.8
2002–03	8.1
2003–04	7.5
2004–05	1.5
2005–06	0.1
2006–07	3.0
2007–08	3.2
2008–09	3.4
2009–10	3.5
Average annual growth, 1998–99 to 2009–10	**1.2**

Sources: ABARE (unpublished data) and MONASH-Coal model.

L2.4 International steel production

Demand for steel is expected to increase broadly in line with global economic growth and industrial production. Recent financial crises in parts of Asia are expected to result in a short-term slowing of world, blast furnace steel production growth (ABARE 1997c and 1998a).

OECD steel consumption is projected to remain relatively stable over the period to 2003. More relevant to Australia, total Asian steel production is forecast by ABARE to grow on average by 2.1 per cent per year to 2005.[5] Japan is forecast

[5] Forecast as at February 1998. Previous forecasts were for growth averaging 3.3 per cent each year.

to decrease steel production by 0.3 per cent per year and India is forecast to increase steel production by 5 per cent per year. These two countries are Australia's largest coking coal destinations, accounting for over half of coking coal exports.

As in the domestic market, technological change in world steel production is affecting coking coal demand. In 2010, 44 per cent of world steel production is expected to use EAF technology, up from 34 per cent in 1995 (ABARE 1998a). Despite the introduction of EAF, Asian blast furnace steel production is still expected to grow at similar rates to total steel production (ABARE 1998a). However, both Japan and India are increasing their use of PCI facilities in blast furnaces, thereby reducing their coking coal requirements. Presently, one tonne of PCI coal replaces about 1.4 tonnes of coking coal (IEA 1997). In recent years, increasing amounts of thermal coal have been used in PCI blast furnaces, further reducing coking coal requirements.

These factors result in modest export prospects for Australian coking coal. Attachment L1 contains more detail regarding coking coal exports.

L2.5 Summary

Electricity

Domestically, increasing competition in the electricity industry will be reflected in the fuel supply market and will be particularly severe on high-cost and inefficient coal producers. The NEM, increased competition in foreign electricity generation and competition from natural gas and brown coal (to the extent that it is possible) may change the nature of electricity markets such that black coal producers will need to respond by developing innovative pricing and supply arrangements.

Steel

The main driver of change in the steel industry with respect to coal is technological development. Growth in the Asian economies will result in increased steel production, although this will be somewhat dampened in the short to medium term following the recent financial crises in some economies. Increasing use of EAF and PCI facilities will partially offset growth in demand for coking coal.

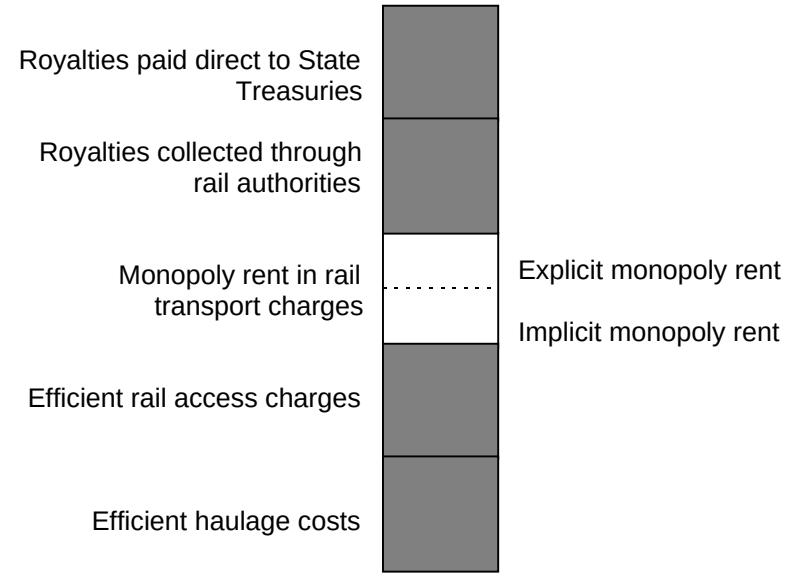
L3 ROYALTY ARRANGEMENTS

This attachment outlines the basis for estimates of future coal royalties which are included in the base case scenario.

L3.1 Current and future royalty arrangements

Current and future coal royalty arrangements in NSW and Queensland are discussed in Chapter 10. A conceptual disaggregation of current royalty and rail charges is presented in Figure L3.1.

Figure L3.1: **Conceptual decomposition of current royalty and rail charges in coal haulage**[a]



a Not to scale.

The impact of expected changes to royalty arrangements on future royalty rates and payments is examined below. Expected changes to monopoly rents in rail transport charges are discussed in Attachment L6.

L3.1.1 New South Wales

NSW imposes a $1.70 per tonne specific royalty on all coal produced as well as an additional $0.50 per tonne 'super' royalty on coal mined from newer, open cut mines.

NSW also collects royalties through the rail system in the form of excess charges for rail access. According to the NSW Government, this amounted to $1.20 per tonne in 1996–97. It is anticipated that this charge will be phased out over four years (by 25 per cent per year) and eliminated by 1 July 2000.

L3.1.2 Queensland

In Queensland, royalties for black coal exports are related to the value of production. Until 1994, coal exports were charged a royalty of 5 per cent and 4 per cent for open cut and underground mines respectively.

An *ad valorem* royalty of 7 per cent of the free on rail value of coal production was introduced in 1994 to apply to coal exports from new mines and mine expansions. This single rate is gradually replacing the two-rate system for existing mines, the changeover being linked to termination of existing rail contracts, as explained below.

Royalties are also collected on coal sold onto the domestic market. Until 1993, this was applied at a specific rate of 5 cents per tonne. The 7 per cent *ad valorem* royalty applying to export coal is also gradually being applied to domestic coal, phasing in at the rate of one per cent per year, over seven years.

As well as output-related royalties, the Queensland Government receives royalties which are collected through Queensland Rail (QR). QR charges for transport of black coal exceed the costs of providing rail transport. Since 1993–94, a portion of this excess charge has been remitted to Queensland Treasury as a coal royalty ($3.05 per tonne in 1995–96).

As existing rail contracts have expired, the royalty collected through QR has been removed and the mines converted to the new 7 per cent *ad valorem* royalty. In mid-1997 those mines still under existing contracts were offered the opportunity to terminate those contracts. It is expected that these contracts will be renegotiated by mid-1998, at which time the royalty charged by QR will cease (sub. 12, p. 10). The mines concerned will continue to pay the *ad valorem* royalty of 5 per cent for open cut mines and 4 per cent for underground mines, in addition to a special royalty, which is negotiated on a mine by mine basis, until 2000. From 2000, the 7 per cent *ad valorem* royalty will apply to these mines and the special royalty will cease.

L3.2 Future royalty rates and revenue

Estimates of future royalties have been incorporated in the MONASH-Coal database so that the impact of various productivity changes on royalty revenue can be quantified.

Drawing on available information about expected changes in royalty charges in NSW and Queensland, Table L3.1 summarises projections for royalty collections, apportioned between thermal and coking coal. These estimates allow MONASH-Coal to keep account of the effect of changes in productivity and black coal industry output on royalty collections. Estimates are expressed as *ad valorem* equivalent rates applied to the free on rail value of black coal.

Due to the phasing out of royalties collected through rail authorities and special royalties, effective royalty rates are anticipated to decline after 1999–00 in the absence of policy changes.

Table L3.1: **Estimated NSW and Queensland black coal royalty rates** (*ad valorem* % equivalents)

	Coking		*Thermal*	
Year	*Paid direct to State Treasuries*[a]	*Collected through rail authorities*[b]	*Paid direct to State Treasuries*[a]	*Collected through rail authorities*[b]
1997–98	6.6	1.9	7.1	2.5
1998–99	7.6	0.3	7.9	0.7
1999–00	7.4	0.1	7.4	0.3
2000–01	5.9	0.0	5.8	0.0
2001–02 to 2009–10	5.8	0.0	5.7	0.0

a Percentage of free on rail value of coal production.
b Percentage of free on rail value of coal railed.
Source: Commission estimates.

The impact of this decline on revenue is projected to be moderated somewhat by modest increases in coal output over the projection period (see Table L3.2).

Table L3.2: **Base case (Scenario 1): estimates for NSW and Queensland black coal royalties (including royalties collected through rail authorities)** ($ million)

Year	*Total*
1997–98	649
1998–99	665
1999–00	679
2000–01	546
2001–02	563
2002–03	572
2003–04	583
2004–05	599
2005–06	617
2006–07	625
2007–08	634
2008–09	645
2009–10	652

Source: Commission estimates.

L4 MODELLING CHANGES IN PRODUCTIVITY AND COSTS

This attachment analyses past productivity trends of the Australian black coal industry. It also explains productivity changes assumed for the MONASH-Coal simulations. The analysis suggests that labour productivity has improved largely as a result of an increase in the capital-labour ratio but that this had only a modest impact on the industry's competitiveness. The growth in total factor productivity in the base case is expected to be broadly similar as in recent years, though the scope for substituting capital for labour will decline.

L4.1 Recent trends in labour productivity

Over the past decade labour productivity in the Australian black coal industry has nearly doubled, from 5.2 kt per employee in 1986 to 9.6 kt per employee in 1996 (Table L4.1).[1] This is equivalent to increasing labour productivity by 6 per cent a year. Part of this productivity improvement was achieved by: reducing employment (the number of persons employed fell by over 2 per cent a year); and increasing output (raw coal production rose by between 3 and 4 per cent a year).

Over the past decade, production has become more concentrated in open cut mines as new open cut mines are commissioned and old underground mines decommissioned. The impact of the gradual shift from underground to open cut operations can be observed in Table L4.2. In 1986, open cut mines accounted for 67 per cent of all raw coal mined. By 1996, this had risen to 71 per cent. Between 1986 and 1996 open cut mines accounted for over 77 per cent of the increase in raw coal production. The greatest labour productivity improvements in open cut mines took place after 1990 and were largely the result of increased output rather than reductions in employment.

[1] As a partial measure, labour productivity provides a limited picture of productivity changes. In addition, if the number of hours worked increased over the decade, growth in labour productivity, measured in terms of output per hour of labour input, will be less than shown in Table L4.1.

Table L4.1: **Recent trends in employment, output and labour productivity in Australian black coal mines, 1986 to 1996**

Year	*Employment*[a]	*Output*	*Labour productivity*
	persons	*'000 t of raw coal*	*'000 t/person*[b]
1986	32 998	170 031	na
1990	29 730	201 368	6.77
1996	26 169	249 934	na
Average annual growth rate (per cent)			
1986 to 1990	-2.58	4.31	6.76
1990 to 1996	-2.10	3.67	5.97
1986 to 1996	-2.29	3.89	6.37

a Employment includes administrative, clerical, coal mine and coal preparation staff, whether employed directly or by contractor. Queensland numbers also include certain off-site staff directly involved in the operations of the coal mine.

b Thousands of tonnes of saleable coal per employee. The JCB and QCB data do not distinguish employment on the basis of hours worked.

Source: JCB and QCB (1997).

The introduction of new capital-intensive technologies in underground mines (that is, longwall equipment) and the closure of uneconomic underground mines is also evident in Table L4.2. Over the decade 1986 to 1996, labour productivity in underground mines rose by approximately 7.4 per cent per year, almost twice the rate for open cut mines (3.9 per cent per year). However, the rate of labour productivity increase in underground mines was higher in the five years to 1990, when it was 8.7 per cent per year. The source of much of the increase in underground mines appears to be reductions in employment rather than increases in output. Between 1986 and 1996, employment in underground mines fell by approximately 4.2 per cent per year whereas output rose by 2.9 per cent per year.

A more detailed examination of the performance across mines reveals that labour productivity actually fell among the least productive mines. According to Table L4.3, the labour productivity of the twenty least productive mines (ranked on the basis of labour productivity in 1995–96) *fell* by 3.6 per cent per year between 1991–92 and 1995–96. In contrast, the labour productivity of the middle twenty mines rose by 5.8 per cent a year. This growth was achieved by reducing labour requirements and increasing output. However, the level of labour productivity of this sample was still less than one-half that of the twenty most productive mines in Australia.

Table L4.2: **Recent trends in employment, output and labour productivity in underground and open cut black coal mines, 1986 to 1996[a]**

	Employment		*Output*		*Labour productivity*[b]	
Year	*UG*	*OC*	*UG*	*OC*	*UG*	*OC*
	persons	*persons*	*'000 t of raw coal*	*'000 t of raw coal*	*'000 t/person*	*'000 t/person*
1986	17 468	12 921	52 737	110 540	3.02	8.56
1990	14 005	13 837	59 008	134 403	4.21	9.71
1996	11 373	13 604	70 139	170 869	6.17	12.56
Average annual growth rate (per cent)						
1986 to 1990	-5.3	1.7	2.8	5.0	8.7	3.2
1990 to 1996	-3.4	-0.3	2.9	4.1	6.6	4.4
1986 to 1996	-4.2	0.5	2.9	4.5	7.4	3.9

a NSW and Queensland black coal mines only. Compare with Table L4.1 which is for all States/Territories. UG is underground, OC is open cut.

b Thousands of tonnes of saleable coal per employee. The JCB and QCB data do not distinguish employment on the basis of hours worked.

Source: JCB and QCB (1996)

Table L4.3: **Recent trends in employment, output and labour productivity among selected mines, 1991–92 to 1995–96[a]**

	1991–92	*1995–96*	*Average annual rate of growth (per cent)*
Top 20 mines[b]			
Employment (persons)	3 722	4 228	3.24
Output ('000 t raw)	54 583.2	73 797.9	7.83
Labour productivity ('000 t/p)	14.67	17.45	4.45
Middle 20 mines			
Employment (persons)	4 152	4 061	-0.55
Output ('000 t raw)	25 715.7	31 488.3	5.19
Labour productivity ('000 t/p)	6.19	7.75	5.78
Bottom 20 mines			
Employment (persons)	3 670	3 670	0.00
Output ('000 t raw)	15 776.3	13 636.2	-3.58
Labour productivity ('000 t/p)	4.30	3.72	-3.58

a Based on a sample of 111 NSW and Queensland black coal mines.

b In 1995–96, average labour productivity of the top 10 mines was 24.3 kt of raw coal per person.

Source: Barlow Jonker (1997).

A similar analysis of the regional patterns of productivity changes suggests that while the most productive mines are predominantly located in Queensland, the most rapid improvements to labour productivity took place in NSW. Improvements in NSW labour productivity were achieved by reducing employment and increasing output. Improvements in labour productivity in Queensland were achieved through increased output while maintaining employment (Table L4.4).

Table L4.4: **Recent trends in employment, output and labour productivity among Queensland and NSW mines, 1986 to 1996**

				Avg. annual rate of growth	
	1986	*1990*	*1996*	*1986–90*	*1990–96*
				%	*%*
Queensland mines					
Employment (persons)	10 629	10 588	10 843	-0.1	0.4
Output ('000 t raw)	82 967	98 982	124 344	4.5	3.9
Labour productivity ('000 t/p)	7.81	9.35	11.47	4.6	3.5
NSW mines					
Employment (persons)	19 760	17 254	14 134	-3.3	-3.3
Output ('000 t raw)	80 310	94 429	116 664	4.1	3.6
Labour productivity ('000 t/p)	4.06	5.47	8.25	7.7	7.1

Source: JCB and QCB (1997).

In summary, there are several reasons for the growth in labour productivity since 1986. They include:

- the commissioning of new capital-intensive open cut mines whose labour productivity is higher than the industry average;
- the decommissioning of older labour-intensive underground mines whose labour productivity is below the industry average;
- continued investment in capital equipment in existing open cut and underground mines, such as switching from continuous miner to longwall equipment in underground mines; and
- an underlying trend in technological change at the industry level and improved work arrangements.

Each factor has the effect of raising labour productivity by raising the capital-intensity (the capital-labour ratio) of the black coal industry. While the highest

levels of labour productivity were evident in open cut mines and in Queensland, the most rapidly improving mines were underground and in NSW.

L4.2 Recent trends in costs and total factor productivity

The cost competitiveness of the Australian black coal industry is influenced by a number of factors. The most important are the cost of inputs (such as materials, energy, capital, labour and other intermediate services), the combined productivity of those inputs (that is, total factor productivity or TFP), and the productivity and cost of margin services (such as rail transport and port handling). The industry's competitiveness is influenced also by new investment in existing and new mines. Drawing on available evidence, this section examines the influence of each factor on the black coal industry's competitiveness.

Table L4.5: **Average annual reductions in costs and export prices, 1986–87 to 1995–96**

	Thermal coal [a]			*Coking coal* [a]		
Year	*Nominal price*	*Real price*	*Change in marginal cost*[b,c]	*Nominal price*	*Real price*	*Change in marginal cost*[b,c]
	A$ t, fob	*A$ t, fob*	*per t*	*A$ t, fob*	*A$ t, fob*	*per t*
1986	45.8	56.8	na	63.3	78.5	na
1990	49.1	47.6	na	61.8	59.9	na
1996	49.3	43.8	na	61.3	54.4	na
Average annual growth rate (per cent)						
1986 to 1990	1.7	-4.3	-5.1	-0.6	-6.5	-7.1
1990 to 1996	0.0	-1.7	-2.3	-0.2	-1.9	-2.8
1986 to 1996	0.8	-2.8	-3.6	-0.4	-4.0	-4.7

na Not applicable.

a Nominal values obtained from ABARE. Real values obtained using the MONASH-Coal GDP deflator.

b The change in the marginal cost is defined as the percentage shift in the industry's export supply curve, where the curve is log-linear with an own-price elasticity of 5. The export demand elasticities are given in Attachment L5.

c Various assumptions of the export supply elasticity were tested. As the export supply elasticity approaches 1, the change in the marginal cost almost doubles from that shown. As the export elasticity approaches infinity, the change in the marginal cost approaches the change in the real price.

Source: Commission estimates based on unpublished ABARE data.

An improvement in the competitiveness of the black coal industry can be represented by a downward shift of the industry's export supply curve.[2] Using historic data and assumptions about the industry's export demand and export supply responses, Table L4.5 reports the average annual reductions in the industry's export prices as well as an indication of the shifts in the industry's export supply curve necessary to match observed price and quantity changes. According to the data underlying Table L4.5, between 1986–87 and 1995–96 the real price per tonne of Australian coal fell between 2.8 and 4 per cent per year.

Table L4.6 summarises how some non-capital input costs have changed over the same period.

Table L4.6: **Changes in the real cost of non-capital inputs to black coal production, 1986–87 to 1995–96**[a]

	Labour costs[b]		*Material costs*[c]		*Total non-capital costs*[d]	
Year	*UG*	*OC*	*UG*	*OC*	*UG*	*OC*
Average annual percentage growth rate						
1986–87 to 1990–91	3.7	3.7	-2.6	-1.1	-0.5	0.5
1990–91 to 1995–96	1.7	1.7	0.2	0.2	0.7	0.7
1986–87 to 1995–96	2.7	2.7	-1.5	-0.8	-0.2	0.3

a Since the data include the brown coal mining sector, figures should be regarded as indicative only.
b Average wages and salaries per employee. Includes severance, termination, redundancy payments, overtime earnings penalty payments and shift allowances, all paid leave, leave loadings and bonuses. Contract labour not included. Percentage changes were deflated by the MONASH-Coal GDP deflator.
c Other includes such non-capital materials as distillate and lubricants, explosives, mechanical spare parts, washplant compounds, electricity, roof supports, and mechanical spare parts. Does not include off-site contract services. Percentage changes were deflated by the MONASH-Coal GDP deflator.
d Total is the share-weighted sum of changes in costs. Labour share is 0.42 and other share is 0.58.
Source: Commission estimates based on ABS (1989, 1991, 1993, 1995, 1997a, 1997b).

The data in Table L4.6 do not include changes in the costs of off-site contract labour and various services. As such, the cost index is only partial. The results suggest that the industry's non-capital input costs, when measured in real terms, changed little between 1986–87 and 1995–96. Labour costs tended to rise in real terms (especially in the period 1986–87 to 1990–91), but material costs tended to fall over the same period.

[2] The discussion should be concerned ideally with the combined domestic and export supply curves. However, data limitations restrict the discussion to the export demand curve. Given that nearly all of coking and the majority of thermal coal production is exported, the result of the following analysis should not be compromised.

If real input costs did not contribute to the industry's improved competitiveness, then the industry's export capacity must have improved as a result of TFP growth and/or new capital investment.[3]

Table L4.7: **Average annual change in total, labour and capital productivity** (%)

	NSW mines	*Queensland mines*
Before 1990–91		
Total productivity[a]	0.3	0.3
Labour productivity	7.7	4.6
Capital productivity[b]	-4.5	-2.5
After 1990–91		
Total productivity[c]	1.0	1.0
Labour productivity	7.1	3.5
Capital productivity[b]	-3.4	-1.2

a 1984–85 to 1988–89 for total factor productivity.

b Calculated using the formula $KP = TFP - S_L*LP$, where KP is capital productivity growth, TFP is TFP growth, LP is labour productivity growth and S_L the share of labour in total costs. Assumes no productivity improvement in materials or fuels.

c 1989–90 to 1994–95 for total factor productivity.

Sources: Commission estimates based on IC (1997a) and JCB and QCB (1997) data.

There are several ways in which the industry can raise its TFP growth. One way is for each mine to adopt better work and management practices and new technologies. Another, is by closing uneconomic mines and replacing their capacity with more efficient operations.

Available measures of TFP growth suggest that the mining sector's productivity grew by 0.3 per cent per year before 1990–91 and by 1 per cent per year after 1990–91. TFP growth is defined as the share-weighted sum of the productivity improvements to labour, capital and other inputs. Assuming that the trend in the TFP growth was the same for both the mining sector as a whole as for the coal mining industry, and given that labour productivity measures are widely

[3] Shifts in the export supply curve could also occur as the result of reducing input costs such as royalties, rail and port charges and other inputs not included in the above cost index.

available, it is possible to obtain the pattern of capital productivity growth since 1986–87.[4] These estimates are reported in Table L4.7.

The TFP growth in the mining sector (and, by assumption, the black coal industry) was below that achieved by the economy as a whole. The average TFP growth for all Australian industries for the period 1984–85 to 1988–89 was 0.7 per cent per year, and for the period 1989–90 to 1994–95 was 1.2 per cent per year. Since labour productivity growth was relatively high and TFP growth low, capital productivity growth must have been negative.

The negative productivity growth of capital is consistent with declining rates of return to capital, since for a given set of prices, declining productivity levels would lower returns to investors. The NSW Minerals Council (1997) survey of NSW black coal mines shows that, between 1987 and 1996, returns to shareholders' funds (including abnormals and extraordinary items) were on average 3.6 per cent a year or less than half of the 11.8 per cent a year for the mining sector as a whole. The high growth in labour productivity and the declining productivity of capital further demonstrates how capital was substituted for labour throughout the late 1980s and early 1990s.

Table L4.8 summarises major factors underlying the apparent shift in the industry's export supply curve between 1986–87 and 1995–96. Since 1986–87, the Australian black coal industry has been able to achieve significant improvements in its competitiveness. Part of this improvement has been obtained by investing in new capital and substituting capital for labour. This had the effect of raising labour productivity and reducing capital productivity (where rates of return to investors have been below levels elsewhere in the mining sector).

Changes in non-capital costs do not appear to have affected the competitiveness of the industry adversely, although this conclusion is limited by the partial nature of the measure. Concurrent with capital expansion, the Australian black coal industry increased its capacity significantly, apparently accounting for much of the observed expansion in exports. Some improvements in rail and port handling also may have had an impact.

[4] It is likely that these TFP growth rates are optimistic since anecdotal evidence suggests that productivity growth in other mining industries was higher than in the Australian black coal industry (sub. 3, sub. 14 and sub. 22).

Table L4.8: **Summary of the black coal industry's performance between 1986–87 and 1995–96** (%)

Year	*Average annual percentage growth rate*[a]
Before 1990–91	
Change in input costs	approx. 0.0
plus changes to TFP	approx. 0.3
plus changes to other factors[b]	approx. 5.8
equal the observed shift in industry export supply	approx. 6.1
After 1990–91	
Change in input costs	approx. -0.7
plus changes to TFP	approx. 1.0
plus changes to other factors[b]	approx. 2.2
equal the observed shift in industry export supply	approx. 2.5

a A negative annual growth rate indicates a decline in competitiveness, and a positive is an improvement in competitiveness.

b 'Other' factors include mostly new investment, improvements in rail and port services, and reductions in the costs of other inputs not otherwise included above.

Source: Commission estimates.

L4.3 Modelling costs and total factor productivity in the base case

Scenario 1 represents the base case simulation of the MONASH-Coal model. In the context of this inquiry, it represents the most likely state of the economy and the Australian black coal industry, were the black coal industry to operate on a business as usual basis and not undertake significant reforms to its work and management practices.

ABARE's projections of export volumes and prices assume that the Australian black coal industry is able to increase slightly its share of world coal trade. This requires Australian producers to continue lowering their real unit costs as they did between 1986–87 and 1995–96. This section provides the Commission's assumptions regarding the industry's productivity improvements in the base case simulation. The implications for the productivity improvements necessary to meet the projections of export prices and volumes are shown in Table L4.9.

Table L4.9: **Projections of average annual reductions in costs and export prices, 1997–98 to 2009–10[a]**

Year	*Thermal coal* [a]			*Coking coal* [a]		
	Nominal price	*Real price*	*Change in marginal cost*[b,c]	*Nominal price*	*Real price*	*Change in marginal cost*[b,c]
	A$ t, fob	*A$ t, fob*	*per t*	*A$ t, fob*	*A$ t, fob*	*per t*
1997–98	48.4	41.6	na	67.4	78.5	na
2003–04	46.1	32.7	na	65.8	59.9	na
2009–10	54.1	32.2	na	69.2	54.4	na
Average annual percentage change						
1997–98 to 2003–04	-0.8	-3.9	-4.5	-0.6	-4.4	-4.1
2003–04 to 2009–10	2.7	-0.3	-0.5	1.0	-1.6	-2.2
1997–98 to 2009–10	0.9	-2.0	-2.5	0.2	-2.6	-3.1

na Not available.
a See notes to Table L4.5 on the method used to obtain estimates of the change in the marginal cost.
Sources: Commission estimates based on Tables L1.1 and L1.2.

Throughout the projection period, the industry's costs must decrease by an average of between 2.5 and 3.1 per cent year to meet the projection export prices and volumes. On the basis of past TFP growth trends, a growth of TFP of approximately 1.2 per cent per year seems achievable for the industry because of increased pressure on black coal producers to improve competitiveness. Export supply also is likely to expand as the result of input cost reductions, continued capital growth, and reforms in rail and port services.

It is likely that there will be less scope for continuing to substitute capital for labour because:

- opportunities to continue investing in longwall equipment in underground mines are declining; and
- low and declining rates of return will reduce the incentive to continue investing in new capital equipment.

On the basis of past productivity trends discussed in Section L4.1, the Commission assumes that labour productivity growth will decline from 6 per cent a year (the average achieved in recent history) to approximately 3 per cent a year. Labour productivity growth is assumed to be 6 per cent per year between 1989–99 and 2002–03. The rate of labour productivity growth is expected to fall until it reaches 3 per cent per year in 2005–06, remaining at that level until 2009–10.

Given that TFP growth is assumed to be 1.2 per cent per year, this implies that, as labour productivity declines from 6.0 per cent per year to 3.0 per cent per year, capital productivity growth gradually improves from -2.5 per cent per year to -0.7 per cent per year. The improved productivity performance in the base case is consistent with rates of return to capital improving (Table L4.10).

Table L4.10: **Projected TFP growth in the base case, 1998–99 to 2009–10**

	1998–99 to 2004–05	*2004–05 to 2009–10*
	per cent per annum	*per cent per annum*
Total factor productivity	1.2	1.2
Labour productivity	gradually declining from 6.0 to 3.0	3.0
Capital productivity[a]	gradually improving from -2.5 to -0.7	-0.7

a Calculated using the formula $KP = TP - S_L*LP$, where KP is capital productivity growth, TFP is TFP growth, LP is labour productivity growth and S_L the share of labour in total costs. Assumes no productivity improvement in materials or fuels.

Source: Commission estimates.

These two assumptions were included in the MONASH-Coal base case simulation (Scenario 1). The 1.2 per cent TFP growth is assumed to occur only among the primary factors, labour and capital, since preliminary studies of the productive efficiency of Australian black coal mines suggest that use of material inputs are relatively efficient (Swan Consultants 1994 and sub. 22). Given that labour and capital (the primary factors) comprise approximately 40 per cent of all industry costs, their productivity would need to increase by 2.9 per cent per year to achieve a 1.2 per cent TFP growth.

Table L4.11 shows the actual primary factor-saving technical change parameters used in the base case simulation. These differ slightly from those implied in Table L4.10 because MONASH-Coal requires a uniform change in all industries' unit requirements for primary factors to reconcile (at the macroeconomic level) movements in real GDP and aggregate factor inputs.

Table L4.11: **Projected primary factor-saving technical shocks employed in MONASH-Coal in the base case, 1998–99 to 2009–10** (per cent per annum)

	Coking coal	*Thermal coal*
Primary factor-saving technical change	2.55	2.94

Source: CoPS estimates.

L4.4 Modelling the changes in productivity

The results of Scenarios 2 to 5 are used to compare potential states of the Australian economy and the Australian black coal industry with the base case simulation (Scenario 1). Scenario 2 assumes that there are no productivity improvements in the Australian black coal industry beyond 1997–98, except for the economy-wide productivity improvements that MONASH-Coal applies to all industries. Scenario 3 assumes that productivity growth in the industry is accelerated as better work and management practices are introduced. Scenarios 4a and 4b use the same productivity assumptions as in Scenario 3, but employ differing assumptions regarding the responses of overseas buyers to changes in Australian coal prices. Scenarios 5a and 5b employ the same assumptions in productivity improvements as in Scenario 3, but also makes additional assumptions about productivity improvements and freight rate reductions by the rail sector.

According to benchmarking studies of the productivity performance of Australian black coal mines, the TFP levels of the average Australian open cut and underground black coal mines are consistently less than the identified better practice mines (Swan Consultants 1994 and sub. 22). On the other hand, dragline operations in Queensland were identified as being best-practice. The size of the productivity gap varied across the mines and mining technologies. The findings suggest that the average Australian black coal mine must increase its TFP level at the mine face by over 30 per cent to match international better practice. The productivity improvements are greatest for NSW truck and shovel mines.

Table L4.12 shows the assumed primary factor-saving technical change for Scenarios 2 to 5. The 30 percentage point primary factor productivity improvement is assumed to occur for Scenarios 3 to 5 over a period of five years. This improvement was spread over the 5 years between 1998–99 and 2002–03, or at 5.38 per cent per year since the productivity growth rate is cumulative. Since the benefits of productivity improvements are assumed to cease after 2002–03, the actual productivity bonus to the industry's primary factors in 2009–10 is approximately 24 per cent.

Scenario 2 illustrates the primary factor-saving technical change in the case where the Australian black coal industry was not able to improve its TFP growth. The slight negative TFP growth reflects the impact of other downstream industries (such as electricity generation and steel mills) continuing to save on the use of the amount of coal input for every unit of their output.

Table L4.12: **Assumed primary factor-saving technical change, by scenario, annual average for period 1998–99 to 2009–10** (per cent per annum)

	Coking coal	*Thermal coal*
Scenario 1	2.55	2.94
Scenario 2	-0.09	-0.09
Scenarios 3, 4a, 4b	4.78	5.18
Scenarios 5a, 5b	4.78	5.18

Source: CoPS estimates.

L5 EXPORT DEMAND ELASTICITIES

This attachment discusses the basis for the export demand elasticities for coking and thermal coal used in the MONASH-Coal model. Conceptual issues are discussed and evidence is provided for the relative magnitude of demand elasticities for coking and thermal coal used in the model.

L5.1 Market structure

The own price elasticity of demand represents the percentage change in the quantity of a good demanded in response to a percentage change in its price. In the MONASH-Coal model, export demand elasticities are used to predict the increase in the demand for Australian exports as a consequence of a decrease in Australia's free on board (fob) prices. Export elasticities are used to model the behaviour of foreign buyers. It is important to use a proper estimate of the export demand elasticities because black coal exports constitute a relatively large share of the total value of Australian exports. Any change in the price of Australian coal may have a significant effect on Australia's total exports.

A number of factors can potentially influence the magnitude of export demand elasticities for black coal. The most important is the structure of the international market for coal. If Australian coal exports face little competition from other coal and energy producers and there are a large number of coal buyers, then Australian coal prices may have a significant impact on world coal prices. In that event, the export demand elasticity used in the MONASH-Coal model would need to be relatively small.

If there are a large number of coal suppliers and buyers, the international market for coal will be competitive. Australian producers will have little influence over world coal prices. In this case, the export demand elasticities used in the MONASH-Coal model would need to be relatively large.

If there are a large number of coal suppliers but relatively few buyers of coal in the international market-place, Australian coal prices will have little impact world coal prices. Accordingly, the MONASH-Coal model would require a relatively large export demand elasticity.

Finally, if Australian coal exports face little competition from other coal producers and there are only a few coal buyers, then world coal prices may be affected by decisions made by both Australian coal producers and the coal buyers. The export demand elasticity used in the MONASH-Coal model would

need to be relatively small. The extent to which Australian coal producers would be able to influence prices would depend on the relative bargaining strengths of both parties.

L5.2 Econometric evidence

There are few studies that have directly estimated the Australian export demand elasticities for thermal and coking coal, although there are several studies that have attempted to measure the related concept — the foreign import demand elasticity. The foreign import demand elasticity is the price responsiveness in overseas countries to changes in the cost insurance freight (cif) price of Australian coal imports. Foreign import demand elasticities can be used to calculate the Australian export demand elasticity, since the Australian export demand curve for coal is (approximately) equal to the sum of the foreign country import demand curves across all countries importing Australian coal.[1] See ABARE 1991 and 1998b for an introduction to the Australian literature on import demand elasticities.

ABARE (1991) estimated the foreign import demand elasticities for Australia's key export markets — Western Europe and Japan. The authors argued that there was sufficient diversity between coal types (on the basis of specific coal characteristics, such as the calorific value, volatility, swelling properties, ash and sulphur content, and on the basis of security of supply) to use an Armington framework to estimate export demand elasticities for Australian black coal.[2] Foreign country import demand elasticities estimated are presented in Table L5.1.

[1] Calculation of export demand elasticities from import demand elasticities is complicated by the fact that export demand curves are denominated in the exporting country's fob price while import demand curves are denominated in the importing country's cif price.

[2] An Armington framework allows a country's imports to be treated as imperfect substitutes for domestically-produced goods. An Armington elasticity is defined as the proportionate change in the ratio of imports to domestically-produced goods, relative to the proportionate change in the ratio of domestic to import prices. A high Armington elasticity implies a high degree of substitutability between the domestic and foreign goods.

Table L5.1: **Foreign country import demand elasticities for Australian black coal, 1979 to 1988, average annual estimates**

Market	*Coal type*	*Aggregate import demand elasticity*[a]
Western Europe	Thermal	-1.21 to -1.31
	Coking	-0.30 to -0.40
Japan	Thermal	-0.40 to -0.79
	Coking	-0.13 to -0.37

a The aggregate import demand elasticity is reported as a range and depends on the assumed value of ε (a country's import demand elasticity for coal). Each foreign country's import demand elasticity is calculated as e+Sε, where *e* is the partial import demand elasticity facing Australia in that country, *S* is the share of that country's coal imports from Australia, and ε is the import demand elasticity in that country for all coal imports.

Source: ABARE (1991, p. 29).

There are two patterns that emerge from the analysis. The import demand elasticities for thermal coal are greater than for coking coal, and greater for Western Europe than they are for Japan. Even if an aggregate export demand elasticity were to be calculated from these import demand elasticities, there are several reasons why the elasticities in Table L5.1 are too small for the purpose of the modelling exercise.

The international thermal coal market is best characterised as comprising a large number of suppliers and customers. Thermal coal is a relatively homogeneous product whose principal pricing characteristic is its energy content (ABARE 1998b, p. 3). Australian thermal coal exports are currently facing increased competitive pressure from suppliers from other countries such as the United States, China and Indonesia.[3] While not all collieries from these regions supply the same export markets as Australian producers, they are contributing directly and indirectly to the increasingly competitive international spot market for coal.

The thermal coal market is also subject to competition from a number of other energy sources such as natural gas. The electricity industries in many countries are also subject to deregulation that is likely to result in greater competition in their input markets (ABARE 1998b).

The world coking coal industry is concentrated in both suppliers and buyers, with Australian exports accounting for 41 per cent of world seaborne trade.

3 More tightly specified open tenders for coal issued by buyers indicates substitution between coals is likely to increase (IEA 1997).

However, a number of factors prevent Australian coal producers from significantly influencing world coking coal prices. The first factor is the ability of Canadian and US coking coal producers to expand production and to switch coal between the European and Asian markets. This supply responsiveness has been facilitated by the Japanese steel mills which have encouraged the coal industries in each country through direct investments and coal purchasing practices.

The second factor limiting the pricing power of Australian producers is the emergence of new technologies in steel-making, such as electric arc furnaces (EAF) and pulverised coal injection (PCI) which enable steel makers to substitute between different coal types and energy sources. This means that coking coal producers increasingly are competing with thermal coal producers and suppliers of natural gas.

Third, while transport costs confer a cost advantage on Australian producers in supplying Asian markets, North American supply to Asia serves as a cap on the maximum price achievable by Australian producers.

Finally, the potential for large domestic coke and coking coal producers, such as China, to develop export capacity imposes a constraint on the pricing power of Australian producers in the longer term (see Chapter 2).

Econometric techniques often can provide estimates that differ from those implied by theory. Econometric models that do not account for shifts of the supply curve, can yield elasticities that are smaller than simultaneous demand and supply models (Orcutt 1950). Also, long term coal price contracts tend to reduce price and quantity variation. In the presence of limited variation in the data, econometric techniques risk reporting an absence of any statistically significant relationship. This can suggest that the underlying export demand elasticities are close to zero.

A characteristic feature of both thermal and coking coal elasticities in Table L5.1 is that they are estimated using quarterly and annual data. As average annual estimates, they do not include distributed lag terms to account for the potential long-run opportunities to switch between coal types and undertake capital investment. The estimates in Table L5.1 are more likely to reflect short-run estimates than long-run estimates.

Both steel mills and thermal coal plants have more scope to respond to such effects in the long-run (particularly since the time horizon of the modelling exercise covers a period of twelve years to 2009–10) by revising coal contracts, adjusting coal blends, seeking alternative energy sources and undertaking new investments. The elasticities given in Table L5.1 need to be adjusted to long-run elasticities for the purpose of the MONASH-Coal model.

L5.3 Commission estimates

Given the increasing competition among coal suppliers world-wide and improved substitution between coal types, it seems appropriate that the export elasticity of demand be re-estimated using the following formula. It expresses Australian export demand elasticity for coking and thermal coal as a function of the share of Australia in the demands and supplies of coal in other countries:

$$\eta_{da} = \eta_{d.} (D_w/Q_a) - \varepsilon_{sc} (S_c/Q_a)$$

where η_{da} = total export demand elasticity for Australian coal, $\eta_{d.}$ = average elasticity of demand of other countries, ε_{sc} = average elasticity of supply of other countries, D_w = other countries' demand, Q_a = Australian production, and S_c = other countries' supply (IAC 1976).

A proxy for $\eta_{d.}$ can be estimated from the Armington elasticities of demand for each of Australia's importing regions estimated by ABARE (1991) using the formula:

$$\eta_{d.} = \Sigma_i (X_{ij}/X_j) \eta_{ijj}$$

where η_{ijj} = the Armington elasticity of demand for a commodity from Australia (country *j*) with respect to a change in price of country *j* in country *i*, X_{ij} = the quantity of coal from Australia (country *j*) consumed in country *i*, and X_j = the total amount of coal exported from country *j*.

A number of studies of energy demand have found that long-run elasticities tend to be between 50 per cent and 200 per cent larger than short-run elasticities (see Dahl 1994 for an overview). For the purpose of the black coal modelling exercise, the long-run elasticities of demand ($\eta_{d.}$) were assumed to be 50 per cent larger than the short-run estimates in ABARE 1991. These long-run elasticities were used to estimate the total export demand elasticity for Australia (η_{da}) for the period 1990 to 1995 (see Table L5.3).

The assumed size of the market in which Australian coal producers compete determines the formula's demand and supply shares, and they in turn, determine the size of the export demand elasticity. If Australian coal producers directly or indirectly compete with North American and European coal mines, then the appropriate demand and supply shares depend on world demand and production. In this case, Australia's export demand elasticity is likely to be large. If Australian coal producers compete with coal producers from the Asian, Pacific and Indian Ocean regions, then the appropriate demand and supply shares depend on regional demand and production. Australia's export demand

elasticity will be smaller. Table L5.2 summarises some of the market shares for Australian thermal and coking coal exports for a number of markets.

Table L5.2: **Shares of Australian coal exports in seaborne coal trade, 1995 and 1996** (per cent)

	Australian exports as a share of:			
	World trade	*Japanese imports*	*Rest of Asia imports*	*Rest of world imports*
Coking coal	41	48	69	25
Thermal coal	22	57	32	6

Source: IEA (1997).

The Australian market share is 41 per cent for world seaborne coking coal trade and 22 per cent for world seaborne thermal coal trade. The contribution of Australian coking and thermal coal exports to Japan and the rest of Asia is greater than for the world as a whole. However, Australia's market shares of the rest of the world's coking coal imports are considerably smaller.

Table L5.3 summarises Australia's share of world and non-European production.

Since the export demand elasticities in the MONASH model do not distinguish between individual importing countries, the elasticities were calculated for various scenarios, each reflecting different assumptions about the relevant coking and thermal coal markets.

Table L5.3: **Shares of Australian coal production in world and regional production, 1995** (per cent)

	Australian production as a share of	
	World production	*Non-European production*
Coking coal	14	16
Thermal coal	3	4

Source: IEA (1997).

The revised elasticity estimates are given in Table L5.4. There are four estimates, reflecting the potential competitors to Australian coal producers. They are:

- all of the world's coal producers;

- all of the world's exporters (that is, not those supplying foreign domestic suppliers);
- all producers in the Asian, Pacific and Indian Ocean regions; and
- all exporters in the Asian, Pacific and Indian Ocean regions (but not producers supplying foreign domestic suppliers).

There is considerable variation among these estimates between the scenarios.

Both the Commission's estimates and those of ABARE (1991) suggest that the quantity response to changes in the price of coking coal is lower than that for thermal coal. The very elastic demand for thermal coal reflects Australia's relatively small share of world production of thermal coal, whereas the less elastic demand for coking coal reflects Australia's relatively large share of world production of coking coal.

Table L5.4: **Australia's total elasticity of export demand for coking and thermal coal, under different scenarios, 1990 to 1995**

	Production[a]	*Seaborne trade*[a]
Coking[b]		
World	-6.8 to -13.8	-2.0 to -4.0
Asia-Pacific & Indian Ocean	-5.7 to -11.5	-1.8 to -3.5
Thermal[b]		
World	-55.3 to -94.2	-6.5 to -10.9
Asia-Pacific & Indian Ocean	-50.3 to -85.7	-5.9 to -9.9

a Shares based on Australia's share in world production, and the share of Australia's exports in world seaborne trade respectively.

b ε_{sc} was assumed to vary between 0.75 and 1.5. $\eta_{d.}$ was derived from estimates in ABARE (1991) by taking a weighted average of the Western European and Japanese import demand elasticities. This average elasticity, η_{ijj}, was inflated by 50 per cent to account for long-run response. $\eta_{d.}$ for coking coal varied between -0.29 and -0.59. $\eta_{d.}$ for thermal coal varied between -0.95 and -1.4.

Source: Commission estimates.

L5.4 Conclusions

The discussion in Section L5.2 argued that, for the purpose of the simulations, the elasticities should capture the long-run responses of overseas buyers in an economic climate where competition for thermal coal was increasing. For

coking coal, the discussion emphasised that the elasticities ought to capture the increasing share of steel production using PCI and EAF technologies and the supply responsiveness of Canadian and US producers.

The econometric evidence presented above suggests that there are differences in demand elasticities for coking and thermal coal. The long-run elasticities are in the order of -1.8 to -13.8 for coking coal and -5.9 to -94.2 for thermal coal. The wide range of these estimates reflects the sensitivity of the elasticities to assumptions of what constitutes the market in which Australian coal producers compete.

These results are consistent with anecdotal observations of Australia's market share in thermal and coking coals. The elasticity of demand for Australian thermal coal is likely to be high given the low share of Australian coal in the world market for thermal coal. The relatively large share of Australian coking coal in the world market explains the relatively smaller elasticity of demand.

For the purpose of Scenarios 2 to 5, the Commission chose elasticities of -10 for coking coal and -20 for thermal coal. The coking coal estimate is at the 'high end' of the range of possible elasticities because of the Commission's view that Australian coking coal producers have little direct influence on international coking coal prices. The estimate for the thermal coal was set at -20 because in MONASH-Coal the upper limit of the demand elasticities is effectively -20 since actual quantity responses are constrained by the supply response of the industry.

To account for possible concerns regarding the size of the assumed export demand elasticities, sensitivity analysis was undertaken for Scenario 3. The elasticities for coking and thermal coal were set at -5 and -10 respectively. The results of the sensitivity analysis are reported in Appendix L. In addition, Scenarios 4a and 4b model the impact of productivity improvements where foreign buyers are assumed to influence prices of Australian black coal exports.

L6 MONOPOLY RENTS AND PRODUCTIVITY IN RAIL TRANSPORT

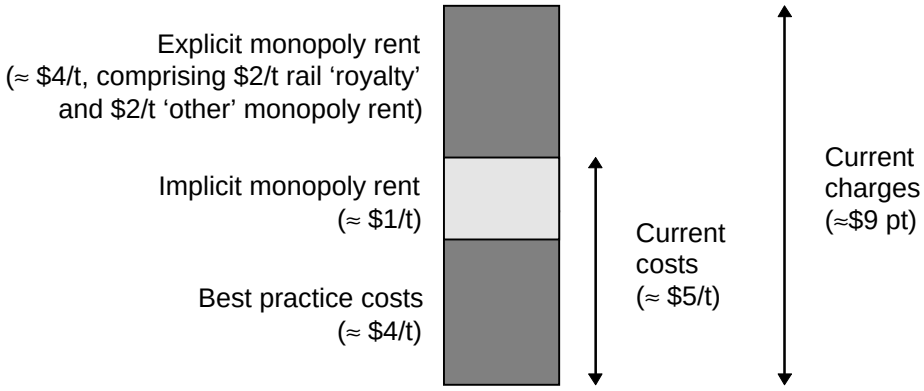
This attachment identifies various elements of rail charges, including explicit monopoly rents and the costs of providing rail services.

L6.1 Monopoly rents

A number of studies (Easton Business Consultants 1988, Freebairn and Trace 1988, IAC 1988, Easton 1996) have noted that charges for coal rail freight services have been higher than the costs of providing those services, indicating the existence of monopoly profits or rents. Monopoly rents in the rail industry are often referred to as *excess charges* or *de facto royalties*. They may comprise excess charges for either or both rail access and haulage.

Figure L6.1 provides a conceptual disaggregation of various elements of charges for rail transport of black coal as well as estimates of each component. These estimates reflect the weighted average rail freight rate per tonne of coal railed in both NSW and Queensland in 1996–97 (see Chapter 7, Table 7.2). In this attachment, the term *explicit monopoly rent* refers to charges for rail services in excess of the current cost (including a return on capital employed) of providing rail services. *Implicit monopoly rent* describes the cost of providing rail services that is in excess of best practice costs.

Figure L6.1: **Disaggregation of average rail charges per tonne of coal railed**[a] (weighted average of NSW and Queensland)



a Not to scale.

L6.2 Modelling rail freight reductions

Two rail freight reduction scenarios have been modelled. Scenario 5a models productivity improvements in rail freight of coal. Scenario 5b models a reduction in coal rail freight rates due to an acceleration of the implementation of competitive access regimes in rail. In reality, increased competitive pressures are likely to drive rail freight rate reductions from both sources simultaneously.

In order to model productivity improvements in rail services to the black coal industry (Scenario 5a), explicit monopoly charges for rail are excluded from estimated rail freight rates. This ensures that the assumed reduction in rail freight rates models a cost reduction and not merely a transfer from rail providers to coal producers. Reductions in freight rates which reflect a reduction in monopoly rents are modelled as a revenue-neutral tax switch (Scenario 5b). In effect, the 'tax' levied on coal rail freight is replaced by an increase in economy-wide taxes. Although, in practice, other taxes might not be increased, to the extent that rail 'monopoly' revenue declines, this implies either a reduction in public sector spending or increased taxation.

From the point of view of the black coal industry, a reduction in rail freight rates delivers benefits whatever its source.[1] However, from an economy-wide perspective, a reduction in explicit monopoly rents largely represents a transfer of income. At best, it might generate marginal gains in national welfare, assuming that taxation through the rail system is a relatively inefficient form of revenue-raising. On the other hand, productivity improvements in rail transport ensure that national income gains are in line with more efficient resource use in the rail industry.

Estimating future rail freight rates in New South Wales and Queensland

As Figure L6.1 indicates, it is estimated that around $4 of the average rail charge per tonne of coal railed represents 'explicit monopoly rent'. As discussed in Chapter 10 and Attachment L3, in both NSW and Queensland, part of this $4 of explicit monopoly rents is acknowledged as a *de facto* royalty. In NSW, a royalty component (of around $1.20/tonne) is incorporated in rail access charges. This royalty will be phased out by 2000–01 (see Attachment L3) and the base case royalty estimates reflect this. In Queensland, about $3/tonne of coal railed has been paid to the Queensland Government by Queensland Rail (QR) as a royalty. The Queensland Government initially

[1] It is possible, of course, that lower *de facto* taxation of the coal industry via rail freight rates is replaced by some other form of tax on the industry (a higher royalty, for example). In this case, net benefits to the coal industry (and the economy) will depend on the relative efficiency of the new tax.

announced that this excess charge for rail freight services would be phased out by 2000. However, early renegotiation of remaining Treasury-negotiated freight contracts will mean that rail royalties are phased out by 1998.[2] In the base case, it is assumed that this $3/tonne rail 'royalty' is phased out by 1998–99 (see Attachment L3).

Studies by Easton (1996 and sub. 7) suggest that other explicit monopoly rents exist in freight charges in Queensland and NSW. This view is supported by the NSW Minerals Council (subs. 52 and DR60) and the Queensland Mining Council (sub. 24). On the other hand, QR and the Queensland Government, for example, consider that all 'monopoly' rents are captured by the rail 'royalty' which is being phased out (subs. 12, DR 61 and DR66).

Based on cost estimates prepared by Easton (1996), explicit monopoly rents (net of rail royalties) in 1995–96 are estimated by the Commission to have been around $2.50/tonne and $3/tonne in NSW and Queensland, respectively. Due to the impact of competition reforms under way in each State, it is assumed that these rents have since fallen to around an Australia-wide average of $2/tonne of coal railed. Moreover, in the base case, this $2/tonne rent is assumed to decline gradually to zero by 2005–06. In other words, in the base case, average rail freight rates for coal are assumed to fall by around $2/tonne (over and above removal of rail 'royalties') between 1997–98 and 2005–06. This implies that average rail freight rates for coal will equal the cost of providing rail services of around $5/tonne (including a return to capital) by 2005–06, and all monopoly rents will have been eliminated.

This assumed reduction in explicit monopoly rents (and freight rates) inevitably leads to falls in estimated rail revenues. In 1995–96, total revenue from explicit monopoly rents (excluding rail royalties) was estimated to be around $390 million. For the base case, this component of rail royalties is estimated to fall to about $310 million in 1997–98, $200 million in 2001–02, and zero by 2005–06.

As noted, the Commission's assessment of excess freight charges is based on cost estimates prepared by Easton (1996). Cost estimates are inherently subjective. They hinge on assumptions about asset valuation and appropriate rates of return (see Chapter 7, Section 7.6). Easton uses historical costs to calculate depreciation and assumes a required rate of return of 8.25 per cent. If the NSW and Queensland Governments consider current costs to be higher (and explicit monopoly rents lower) than estimated by the Commission, the extent of

[2] However, as discussed in Chapter 10 and Attachment L3, mines that opt to renegotiate their rail contracts will be subject to a special royalty until 2000. This special royalty has been incorporated in estimates of output-related royalties in the base case.

freight rate reductions assumed by the Commission in the base case may be optimistic (see Chapter 7, Section 7.5). If actual rail freight rates are higher than estimated, base case export and output projections, which are imposed on the model in Scenario 1, will not be affected, though black coal industry profitability could be lower than projected.

Scenarios 5a and 5b: scope for productivity improvements and rail freight rate reductions

As discussed in Chapter 7, the gap between Australian coal rail freight operations and comparable best practice overseas operations is estimated to be around 20 per cent. In Scenario 5a, it is assumed that this productivity gap is closed. Productivity improvements and the ensuing freight rate reduction are phased in over five years, beginning in 1998–99. This parallels accelerated productivity improvements within mines which are modelled in Scenario 3 and delivers additional cost savings to the coal industry of around $1/tonne of coal railed (assuming a cost base of around $5/tonne), or around $150 million per year.

Scenario 5b models early removal of estimated explicit monopoly rents in rail by 2001–02 instead of 2005–06 as assumed in the base case. In other words, average rail freight rates (Australia-wide) for coal fall to around $5/tonne by 2001–02. This scenario is designed to illustrate potential benefits to the coal industry of expeditious introduction of effective, competitive access regimes for rail services. As for Scenario 5a, lower freight rates are modelled together with productivity improvements in the mines (Scenario 3). In addition, for reasons explained above, freight rate reductions in this scenario are modelled as a revenue-neutral tax change.

As already noted, if the Commission's estimates of explicit monopoly rents are higher than State government assessments of these charges, or if reductions in explicit monopoly rents do not occur as projected in the base case, the estimated reductions in freight rates in the base case may be somewhat optimistic. This would imply scope for freight reductions additional to those modelled, either through productivity improvements or removal of monopoly rents. For example, if current freight rates (net of rail royalties) reflect actual costs (that is, costs of around $7/tonne) and do not contain any monopoly rent, a 20 per cent productivity improvement would yield a larger cost saving than $1/tonne (around $1.40/tonne). Alternatively, if monopoly rents exist, but are not phased out by 2005–06 as assumed in the base case, there would be scope for larger cost savings to accrue to the coal industry.

L7 REGIONAL EFFECTS OF PRODUCTIVITY CHANGE

L7.1 Introduction

Differences in labour productivity growth between regions can significantly affect the proportion of coal produced by different States. In this attachment the share of black coal output produced by Queensland and NSW is projected to 2010. It is shown that the result largely depends on expected relative productivity changes.

Output and employment details are available for Australian black coal mining over the period 1987 to 1996. This includes production and employment by State and by mine type (underground and open cut).[1] Table L7.1 summarises this information.

This attachment combines this disaggregated historical information, MONASH-Coal estimates of future aggregate black coal output and employment change and labour productivity assumptions to present possible regional and technological scenarios of future output and employment (and hence, labour productivity) in Australian black coal mining.

L7.2 History

Over the decade to 1996, Australian production of black coal grew at over 3 per cent each year, on average, while employment fell by nearly 2 per cent a year. This has resulted in labour productivity gains averaging over 5 per cent each year (Table L7.1).

[1] Sources for this information include the Joint Coal Board, Queensland Coal Board, the Australian Coal Report and the ABS. The main source of historical information used in this attachment (and in the productivity attachment L4) is JCB and QCB (1997).

Table L7.1: **Output, employment and labour productivity in Australian black coal mining, 1987 to 1996**[a]

		1987	*1996*	*Average annual percentage change*
Saleable production	*Mt*	138.4	190.0	3.59
Employment	*'000 persons*	29.5	25.0	-1.83
Labour productivity	*kt/person*	4.7	7.6	5.52

a NSW and Queensland only. All other States accounted for less than 5 per cent of total Australian production in 1996.

Source: JCB and QCB (1997).

In aggregate, black coal production is shared evenly between Queensland and NSW. However, thermal coal production occurs mainly in NSW and coking coal production mainly in Queensland, although this disparity is closing (Table L7.2). Over the decade to 1996, thermal coal production has grown faster in Queensland while coking coal has grown slightly faster in NSW. The MONASH-Coal Model represents black coal as coking and thermal coal separately.

Table L7.2: **Saleable production by coal type and State, 1996**[a] (Mt)

	Thermal	*Coking*	*Total*
NSW	63.5	30.8	94.3
Queensland	40.7	55.0	95.7
Total	**104.2**	**85.8**	**190.0**

a Coking coal production = coking coal exports + increase in stocks + consumption by iron & steel and metallurgical industries + increase in domestic iron and steel industry stocks. Thermal coal = Total - coking coal.

Source: Australian Coal Report (1997).

Output

Total output of underground mines in Queensland has grown faster than any other, albeit from a very low base. NSW open cut mines have been the next fastest growing, and now account for one quarter of total production. Open cut mining in Queensland accounts for the largest share of total output — 44 per cent in 1996. NSW underground mines have shown the slowest growth in output — less than 1 per cent, on average, each year since 1987 (Table L7.3).

Table L7.3: **Saleable coal production by State and mine type**

		1987	*1996*	*Average annual growth 1987 to 1996*	*1996 share*
		kt	*kt*	*%*	*%*
NSW	Underground	43 511	46 999	0.86	25
	Open cut	26 368	47 303	6.71	25
Queensland	Underground	3 747	11 364	13.12	6
	Open cut	64 745	84 333	2.98	44
Total		**138 371**	**189 999**	**3.59**	**100**

Source: JCB and QCB (1997).

Employment

Nearly all of the losses in employment in the black coal industry over the last decade have occurred in NSW underground mining. Employment in NSW open cut mines and Queensland underground mines has actually increased over the period. Despite employment falls over the period to 1996, NSW underground and Queensland open cut mining account for 70 per cent of total black coal employment (Table L7.4).

Table L7.4: **Average employment, by State and mine type**

		1987	*1996*	*Average annual growth 1987 to 1996*	*1996 share*
		persons	*persons*	*%*	*%*
NSW	Underground	14 926	8 999	-5.47	36
	Open cut	4 298	5 135	2.00	21
Queensland	Underground	1 676	2 374	3.94	10
	Open cut	8 605	8 469	-0.18	34
Total		**29 505**	**24 977**	**-1.83**	**100**

Source: JCB and QCB (1997).

Labour productivity

Labour productivity, measured as output per employee, is highest in Queensland open cut mining at nearly 10 000 tonnes of saleable coal per employee. However, the fastest labour productivity growth has occurred in underground mining, although accounting for a smaller share of total output.

Table L7.5: **Output per employee, by State and mine type**

		1987	*1996*	*Average annual growth 1987 to 1996*
		kt/employee	*kt/employee*	*%*
NSW	Underground	2.92	5.22	6.69
	Open cut	6.13	9.21	4.62
Queensland	Underground	2.24	4.79	8.83
	Open cut	7.52	9.96	3.16
Total		**4.69**	**7.61**	**5.52**

Source: JCB and QCB (1997).

L7.3 Projections

Scenario 3 estimates provide a picture of aggregate coking and thermal output and employment in 2009–10, if accelerated productivity improvement is achieved in the industry (see Appendix L). Table L7.6 outlines the relevant estimated growth rates.

Table L7.6: **Scenario 3 estimated average annual change, 1997–98 to 2009–10** (%)

Coal type	*Production*	*Employment*
Coking	4.68	-4.26
Thermal	5.33	-3.20
Total[a]	**5.04**	**-3.64**

a Weighted geometric average based on relative contribution of coking and thermal to total output.
Source: MONASH-Coal estimates (Scenario 3).

In this accelerated productivity scenario, production is projected to grow more strongly than observed historically (5.03 per cent compared with 3.59 per cent) and employment is projected to fall more quickly (-3.64 compared to -1.83), although employment reductions are less severe than in the base case.

These estimated growth rates were applied to 1996 output and employment data to obtain aggregate 2010 results. That is, total coking and thermal black coal output and employment in 2010 were estimated from 1996 values using annual projected growth rates from Scenario 3. Estimates for each State and mine type were then derived from these aggregates on the basis of observed historical

trends and assumptions regarding future labour productivity change.[2] Two different sets of assumptions were used. These are presented as Regional Scenarios A and B.

Regional Scenario A

Regional estimates are presented in Chapter 11 and Appendix L. These estimates are derived assuming that the share of total black coal production remains unchanged from its current even distribution between Queensland and NSW. This is achieved by assuming that labour productivity converges by 2010. That is, labour productivity in NSW open cut mining is assumed to achieve at least the same level as that in Queensland open cut mining by 2010.[3] It is further assumed that labour productivity in Queensland underground mining achieves levels at least as high as labour productivity in NSW underground mining by 2010.[4]

Table L7.5 demonstrates that Queensland underground mines currently have, on average, the lowest levels of labour productivity and that NSW open cut labour productivity is lower than Queensland open cut mines. That is, there is greater scope for productivity improvement in these mines (in aggregate).

Table L7.7 presents regionally disaggregated estimates of black coal production, based on the assumption of labour productivity convergence discussed above.

Although the distribution of black coal production between the two States remains unchanged in total, the share produced by open cut mines in NSW increases. Output from open cut mines is expected to increase from 69 per cent to 75 per cent of combined NSW and Queensland production by 2010.[5]

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[2] Linear programming is used to find a solution to the problem of equating the sum of the regional results with the aggregates given by MONASH-Coal while simultaneously satisfying the constraints imposed by assumption. There are many solutions to the problem. Those presented here are not necessarily any more likely than others, but are the closest to observed history that also satisfy the constraints. The solutions presented are *possibilities* and demonstrate that the regional results presented in Chapter 11 and Appendix L are feasible.

[3] Not the 1996 level, but that level which is necessary for a possible solution to exist, based on historical growth rates.

[4] These constraints are binding. By 2010 labour productivity levels are equal (Table L7.9).

[5] There are adequate identified *in situ* reserves for projected 2010 output levels to be maintained for hundreds of years.

Table L7.7: **Saleable production, historical and estimated** (%)

State	*Mine type*	*Average annual growth 1987 to 1996*	*1996 share*	*Average annual growth 1996 to 2010*	*2010 share*
NSW	Underground	0.86	25	0.88	14
	Open cut	6.71	25	7.84	36
Queensland	Underground	13.12	6	9.48	11
	Open cut	2.98	44	4.14	39
Total		**3.59**	**100**	**5.04**[a]	**100**

Source: MONASH-Coal estimates (Scenario 3).

NSW open cut output is projected to grow faster than Queensland to achieve the assumed convergence in labour productivity. It is able to do this with slower employment reductions (Table L7.8).

Table L7.8: **Average employment, historical and estimated**

State	*Mine type*	*1996*	*Average annual growth 1987 to 1996*	*2010*	*Average annual growth 1996 to 2010*
		persons	*%*	*persons*	*%*
NSW	Underground	8 999	-5.47	3 570	-6.39
	Open cut	5 135	2.00	4 096	-1.60
Queensland	Underground	2 374	3.94	2 715	0.96
	Open cut	8 469	-0.18	4 478	-4.45
Total		**24 977**	**-1.83**	**14 859**	**-3.64**[a]

Source: MONASH-Coal estimates (Scenario 3).

Note that over half of the total employment loss is estimated to occur in NSW underground mining, which is currently the largest employer. However, this is not as great as observed historically, where, over the decade to 1996, employment losses in NSW underground mining *exceeded* the fall in total black coal employment (Table L7.4). It is also not as great as it would have been without accelerated productivity growth.

By 2010, Queensland open cut mining is estimated to have become the largest employer, followed by NSW open cut mining. In total, open cut mining is estimated to increase its share of total employment in the black coal industry to 58 per cent by 2010.

These output and employment projections result in labour productivity outcomes presented in Table L7.9, remembering that labour productivity in Queensland underground mining is constrained to be at least that of NSW in 2010 and NSW open cut labour productivity is constrained to be at least that of Queensland (productivity convergence).

Table L7.9: **Labour productivity, historical and estimated**

State	*Mine type*	*1996*	*Average annual growth 1987 to 1996*	*2010*	*Average annual growth 1996 to 2010*
		kt/person	*%*	*kt/person*	*%*
NSW	Underground	5.22	6.69	14.88	7.76
	Open cut	9.21	4.62	33.23	9.60
Queensland	Underground	4.79	8.83	14.88	8.44
	Open cut	9.96	3.16	33.23	8.99
Total		**7.61**	**5.52**	**25.47**	**9.01**

Source: MONASH-Coal estimates (Scenario 3).

Regional Scenario B

In Regional Scenario A labour productivity levels are projected to converge. This may not be the case. For example, there may be greater scope for productivity improvement in both open cut and underground mining in NSW than in Queensland. Therefore, if it is assumed that NSW labour productivity in 2010 is at least that of Queensland in both underground and open cut mining (and the labour productivity convergence assumption is dropped), regional distributions of output and employment will differ from Regional Scenario A (Table L7.10).

In this scenario, NSW's share of total output grows to 65 per cent, due to significant growth in open cut mining. Queensland's share in both open cut and underground mining falls. This was not the case in Regional Scenario A, where Queensland underground mining's share of total output grew. Total open cut mining's share of output grows to 83 per cent, greater than in Regional Scenario A.

Table L7.10: **Saleable production, historical and estimated** (%)

State	*Mine type*	*Average annual growth 1987 to 1996*	*1996 share*	*Average annual growth 1996 to 2010*	*2010 share*
NSW	Underground	0.86	25	0.78	14
	Open cut	6.71	25	10.57	51
Queensland	Underground	13.12	6	1.14	4
	Open cut	2.98	44	2.53	32
Total		**3.59**	**100**	**5.04**[a]	**100**

Source: MONASH-Coal estimates (Scenario 3).

Output grows faster in NSW than Queensland, although Queensland employment falls faster (Table L7.11). Open cut mining in NSW continues its historical trend of employment growth.

Table L7.11: **Average employment, historical and estimated**

State	*Mine type*	*1996*	*Average annual growth 1987 to 1996*	*2010*	*Average annual growth 1996 to 2010*
		persons	*%*	*persons*	*%*
NSW	Underground	8 999	-5.47	3 881	-5.83
	Open cut	5 135	2.00	6 171	1.32
Queensland	Underground	2 374	3.94	986	-6.08
	Open cut	8 469	-0.18	3 821	-5.53
Total		**24 977**	**-1.83**	**14 859**	**-3.64**[a]

Source: MONASH-Coal estimates (Scenario 3).

Combining the above output and employment results in the following labour productivity outcomes (Table L7.13), remembering that labour productivity in NSW is constrained to be at least as great as in Queensland.[6]

6 Note that this constraint is binding.

Table L7.12: **Labour productivity, historical and estimated**

State	*Mine type*	*1996*	*Average annual growth 1987 to 1996*	*2010*	*Average annual growth 1996 to 2010*
		'000t/person	*%*	*'000t/person*	*%*
NSW	Underground	5.22	6.69	13.50	7.02
	Open cut	9.21	4.62	31.30	9.13
Queensland	Underground	4.79	8.83	13.50	7.68
	Open cut	9.96	3.16	31.30	8.52
Total		**7.61**	**5.52**	**25.47**	**9.01**

Source: MONASH-Coal estimates (Scenario 3).

L7.4 Summary

When MONASH-Coal aggregate estimates and past trends are used to determine the regional distribution of black coal production and employment, assumptions regarding future relative labour productivity change greatly affect the regional result.

Under the two scenarios presented in this attachment, the outcome for underground mining output in NSW is the same (Table L7.13). However, depending on relative labour productivity improvements, underground mining in Queensland could either increase its share of total output (at the expense of Queensland open cut mining) or lose output share (to NSW open cut mining). In both scenarios, open cut mining's output share is projected to increase in NSW and decrease in Queensland.

Table L7.13: **Saleable production shares, historical and estimated**

State	*Mine type*	*Actual 1996*	*Estimated 2010*	
			Regional Scenario A	*Regional Scenario B*
		%	*%*	*%*
NSW	Underground	25	14	14
	Open cut	25	36	51
Queensland	Underground	6	11	4
	Open cut	44	39	32
Total		**100**	**100**	**100**

Regional results discussed in Chapter 11 and Appendix L assume that each State's share in aggregate black coal output remains unchanged. That is, total output is distributed evenly between Queensland and NSW in 2009–10. Regional Scenario A is a possible representation of this.

This analysis demonstrates the importance of productivity change to the future structure of the industry. It is important to note that relative productivity change different from that presented *may* result in a different industry structure.

L8 REFEREES' REPORTS ON ECONOMIC MODELLING OF BLACK COAL

This attachment summarises external referees' comments on economic modelling which was commissioned by the Productivity Commission for the inquiry. Copies of the referees' written reports are available from the Commission on request.

L8.1 Summary of the referees' reports

The Productivity Commission used the MONASH model of the Australian economy to assess the potential quantitative impact of productivity improvement on the black coal industry, other industries and the economy as a whole. Two external referees (see Box L8.1) were appointed in early 1998 to comment, *inter alia*, on the choice of model and major assumptions underlying the modelling work. They were each required to prepare a written report as well as make an oral presentation at a public workshop held at the Productivity Commission in Melbourne in late January 1998.

Box L8.1: **About the referees**

Dr Rod Tyers is a Reader in the Department of Economics at the Australian National University. He completed his doctorate in economics at Harvard University in 1978 and his research since has focussed on international trade, agriculture and development. He is the author of four books, 48 articles and 28 chapters in edited collections.

Mr David Vincent is Chief Economist with the Centre for International Economics, a private company which conducts economic analysis for Australian and international clients. He has extensive experience in analysing economic policy issues in agriculture, mining, water resources, manufacturing and service industries, as well as wide-ranging expertise in application of modelling techniques.

On the whole, both referees endorsed the modelling undertaken. For example, Dr Rod Tyers concluded that "the analysis thus conducted is of a very high analytical quality and it is spelled out in both the CoPS and the draft IC documentation quite clearly…". Mr David Vincent reported that "The analysis in the paper is sound … The results seem plausible and internally consistent". Nonetheless, several suggestions were made with a view to improving both the

modelling and the documentation. Box L8.2 provides a summary of major suggestions, and the Commission's response.

Box L8.2: **Summary of referees' comments and the Commission's response**

Dr Rod Tyers:

- *asked why the Commission did not construct a detailed, disaggregated model of the Australian black coal industry as this could offer more insights into the scope for, and impact of, productivity improvements.* While the Commission agrees that construction of a detailed industry model could have provided further insights, the Commission was constrained by both time and resources. Use of the MONASH model, customised to provide some, albeit limited, disaggregation of the industry was, as Dr Tyers observed, "relatively cost-effective";
- *suggested that it would be interesting to model the impact of changing external circumstances — for example, the impact of global emission controls.* The base case coal export projections reflect ABARE's view about likely developments in world coal markets. ABARE forecasts thus encapsulate views about the likely impact of trade liberalisation, changing technologies, global environmental treaties etc. on world demand for, and supply of, coal. Of course, circumstances can change. If, for example, world demand for coal were to drop sharply, the Australian coal industry would receive lower prices. This would not undermine the case for productivity change — indeed, it would strengthen it — though the *level* of exports in all scenarios would be lower than currently suggested;
- *recommended that the Commission should conduct sensitivity analysis in order to gauge the impact on the results of lower export demand elasticities for Australian coal. This, he suggested, was especially relevant if the supply elasticity of coal in the model was large.* The Commission has conducted sensitivity analysis with respect to Scenario 3. The results are reported in Appendix L;
- *recommended that the modelling address labour market adjustment issues.* Labour market adjustment is discussed in Chapter 6 of the report. The modelling suggests that with improved productivity and higher output, fewer jobs would be lost in the black coal industry than would be the case without productivity change. Overall, therefore, productivity improvements should ease labour market dislocation. However, *within* the industry, productivity improvement may lead to changes in demand for certain job types as well as changes in demand for labour across mining regions. These effects are not captured by the modelling which does not differentiate regions or job types. A specialised model of the Australian black coal industry could provide further insight. However, as already noted, the Commission did not pursue this option due to time and resource constraints.

Box L8.2: **Summary of referees' comments and the Commission's response** (continued)

Mr David Vincent:

- *suggested that Scenario 3 could be made more interesting, and realistic, by linking assumed productivity improvements more closely with potential changes in work practices.* The Commission agrees that more specific modelling of changes in work practices might have provided additional insights, but it was considered that estimation of the productivity gains flowing from removal of individual work arrangements could be arbitrary. While broad estimates of the gap between average Australian black coal productivity performance and best practice are available, the impact of individual work arrangements on productivity is difficult to quantify. Hence, the Commission modelled an across-the-board productivity improvement reflecting the potential impact of improving a wide range of work arrangements identified in Chapter 5;
- *questioned the logic underlying Scenarios 4a and 4b*. These scenarios model varying degrees of market power exercised by foreign coal buyers. In Scenario 4a, it is assumed that foreign buyers 'siphon off' additional profits flowing from the productivity improvement. Mr Vincent suggested that the scenario was unrealistic because it presupposes that foreign buyers know the rate of return on capital invested in the Australian industry. While this may be so, the Commission considers that the scenario captures reasonably well a situation in which foreign buyers might be able to exercise limited buying power. Scenario 4b models a scenario where foreign buyers capture *all* of the benefit of the productivity improvement by reducing their demand for coal. In effect, this scenario models a situation where foreign demand is totally unresponsive to lower prices. Although the Commission does not consider that this scenario presents a realistic view of world coal markets, it was modelled to demonstrate that, even with such an extreme assumption, productivity improvements can deliver GDP gains;
- *observed that the labour market closure of the model was very pessimistic and urged the Commission, in a separate exercise, to investigate the determinants of labour market supply and, in particular, its responsiveness to changes in economic efficiency.* The Commission agrees that the labour market closure, which implies that economy-wide employment does not expand in response to higher real wages driven by productivity improvements, is very pessimistic. A major reason for adopting this closure is that it is conservative, reflecting an observed 'stickiness' in unemployment. The Commission agrees with Mr Vincent's suggestion that this matter be analysed further.

M ISSUES IN MODELLING PRODUCTIVITY CHANGE

Appendix L presents estimates of the impact of various productivity changes on the black coal industry and the rest of the economy. These estimates are sensitive to assumptions about how industries, governments and individuals respond to productivity changes in the black coal industry. This appendix discusses the major assumptions underlying the modelling of the black coal industry and the results presented in Appendix L.

M.1 Issues in assessing the impact of changes in productivity

Major issues considered include:

- the criteria used to evaluate the impact of productivity changes;
- measuring changes in national economic welfare;
- government responses to changes in revenue;
- terms of trade effects;
- adjustment in the labour market and long-run employment growth;
- how investment and capital stocks adjust;
- the nature of the productivity shock and the implications for factor demands; and
- sectoral adjustments and adjustment costs.

M.2 Criteria to evaluate the impact of productivity changes

At issue here is how to choose appropriate measures to assess the impact of productivity changes in the black coal industry on the community.

It is important to use measures that capture the economy-wide effects of policy changes, rather than the effects of changes on a particular industry or sector of the economy. Partial equilibrium analysis will not provide an adequate indication of the economy-wide effects of productivity change, although it may capture some important effects.

Thus, it is useful to use a measure that represents the net effects on the community as a whole, though such measures should be viewed in conjunction

with more disaggregated information, as discussed below. The ideal measure is economic welfare, which is related to the net benefits derived from consumption of goods and services. While economic welfare is not measured directly, under certain conditions, changes in real private consumption may provide a good approximation of changes in economic welfare.

Another measure is GDP, while this provides a good indication of changes in overall economic activity, it is not a good indicator of economic welfare. An increase in GDP does not necessarily translate into a similar increase in domestic consumption.

Changes in real private consumption are a reasonable measure of changes in aggregate economic welfare, provided the full costs of generating the additional consumption are taken into account. For example, in the case of a productivity improvement, more income can be produced using existing resources. However, not all of this measured income and consumption gain necessarily represents a gain in welfare.

First, it is possible that some employees and management incurred costs in implementing productivity improvements. These might include the costs of additional effort, or non-pecuniary benefits given up by employees. Strictly speaking, such costs should be subtracted from the measured change in real consumption in order to indicate the impact on economic welfare. However, because of estimation difficulties (and also the possibility that productivity changes generate non-pecuniary benefits), no adjustments are made to the results presented in Appendix L. Nonetheless, this qualification should be borne in mind.

The productivity improvement also might encourage additional investment and employment which, in turn, would generate additional income and real consumption. But the measured increase in real private consumption in any year would not reflect a *net* welfare gain unless the full cost of these additional resources were taken into account. In the MONASH analysis, all additional capital (relative to the base case) is assumed to be supplied by foreigners, and after-tax income earned by these investors is excluded from estimates of real consumption. Moreover, by the end of the forecast period (2009–10), employment is assumed to return to the level projected in the base case. In other words, the full cost of additional (foreign-owned) capital is accounted for, and in the long run, there is no additional aggregate labour effort (see Sections M.3 and M.5). Subject to the caveat about the real costs of implementing productivity changes, these assumptions make real consumption an appropriate aggregate measure of economic welfare.

However, aggregate real consumption does not take into account the welfare effects of income redistribution. While productivity improvements, by generating higher national income and aggregate real consumption, have the *potential* to make everyone better off, restructuring of the economy will affect the distribution of income and this may impinge unevenly on the welfare of individuals. Aggregate measures, while providing the best criteria for assessing the economy-wide net benefits (or costs) of any change, nonetheless mask the impact of redistribution on economic welfare.

It is useful, therefore, to examine the impact of productivity improvements using a range of measures — in particular, those that provide some insight into the adjustments throughout the economy.

The Commission chose the MONASH model to quantify the impacts on the economy of changes in productivity performance of the Australian black coal industry because, in addition to aggregate measures such as real GDP and real consumption, it provides a high level of industry disaggregation.

M.3 Changes in real consumption and ownership of the capital stock

As discussed in Section M.2, changes in real consumption are used as an indicator of the net welfare gains to Australians arising from changes in productivity performance in the black coal industry. Ownership of returns to the existing capital stock and to net additions to the capital stock must be accounted for to ensure that real consumption provides an accurate measure of welfare.

With a productivity improvement, more income (GDP) can be produced with existing capital and labour. But this increase in the value of output is not 'owned' entirely by domestic residents and real consumption must be adjusted to reflect this. This effect, which has not been incorporated in the model, will have a moderating effect on the estimated gain in real private consumption (and economic welfare), particularly in the short term.

In addition, in evaluating the impact of a productivity change over time, it is important to take into account any consequences for current and future consumption arising from the way in which current consumption and investment are financed.

An increase in current consumption could be financed by borrowing rather than through an increase in current income. If this were the case, initial changes in real consumption would overstate the increase in economic welfare because they would not take into account the future reduction in consumption when borrowings have to be repaid.

In the case of a productivity improvement in the black coal industry, for example, the initial increase in profitability in coal will attract additional investment into that industry. The financing of this extra investment will have implications for the time profile of real consumption.

One possibility is that Australians finance the investment through domestic savings. In this case, real consumption is comparatively lower in earlier periods when they save and invest. In later periods, however, Australians reap the rewards of investment as higher consumption.

Alternatively, Australia could borrow on international capital markets or use direct foreign investment (equity) to finance the additional investment.[1] In this case, consumption will be higher in earlier periods, compared with domestically financed investment, but relatively lower in later periods. Real consumption is lower in later periods because the income generated by the foreign-owned capital accrues to foreign investors as dividends or as interest and loan repayments.

The second financing option was adopted in this study because it provides a way of keeping track of the ownership of incremental capital (and the after-tax profits which accrue to overseas investors) and allows changes in real consumption to be proportional to changes in current income. Thus, in any given year, the change in real consumption can be interpreted as the change in aggregate economic welfare in that year.

M.4 Government responses to changes in revenue; real consumption and the government sector

In the base case scenario, it was assumed that royalty collections (including rail-related royalties) by the NSW and Queensland Governments would decline in real terms over the forecast period. This assumption embodies announced policies by both governments to reduce and/or modify their royalty arrangements. These changes are explained in detail in Attachment L3. While small changes in royalty revenue are consistent with changes in the share of public consumption over the forecast period, there are implications for State government revenues.

[1] This implies that the marginal propensity to save by households is zero. This is probably an extreme assumption but the saving propensity is quite low currently. The assumption leads to a slight overestimation of immediate consumption gains and underestimation of consumption in later periods.

When evaluating the impact of shocks relative to the base case scenario, the MONASH analysis assumes that aggregate *public* consumption maintains its base case level. This means that changes in real private consumption measure changes in aggregate economic welfare, *provided* there is no change in the government sector deficit or surplus position.[2] However, in order to maintain real public consumption, without changing the government deficit or surplus position, tax revenues must be kept constant. This implies that any reduction in revenue from some taxes must be offset by raising other taxes, and vice versa.

In the deviation scenarios (Scenarios 2–5), there are no assumed changes to royalty or other indirect tax *rates*, though royalty revenues rise or fall in line with expansion or contraction of the industry. In addition, higher (lower) labour income and profits and higher (lower) spending generate higher (lower) indirect and direct tax revenues. Given the assumption of constant real public consumption (relative to the base case), and no change in the government deficit, induced changes in revenue will affect estimated current real private consumption through changes in income tax rates.

M.5 The black coal industry and the terms of trade

If productivity changes in the black coal industry directly affect the export price of coal or, indirectly, the prices of other internationally traded commodities, the impact on GDP, and the purchasing power of national income, will be affected.

The extent of Australia's influence on world or regional coal prices is discussed in detail in Attachment L5.

The issue addressed here is the indirect terms of trade effects following black coal industry contraction or expansion. This occurs because induced changes in the volume of exports of other major export industries (for example, wool) and their prices on world markets affect the terms of trade.

As explained in Box L.5 (Appendix L), a productivity improvement in the black coal industry tends to squeeze export and import-competing industries via real exchange rate appreciation. The resulting increase in the demand for imports by Australians is assumed not to affect the *foreign* price of imports because Australian import demands are a relatively small proportion of world sales.

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[2] If public consumption is maintained by increasing the deficit (or reducing the surplus), for example, this represents a claim on future consumption and measured current private consumption will overestimate the net welfare gain. If the government surplus increases (or the deficit is reduced), this represents an increase in current savings. In this case, measured current private consumption will underestimate the welfare gain.

On the other hand, the MONASH model assumes that the world price of some commodities depends on the level of Australian exports. This assumption is incorporated in most models of the Australian economy and can be justified on the grounds that some commodities exported from Australia have attributes that differentiate them from those produced by other countries. Induced *contraction* of these export industries, as a result of black coal industry expansion, tends to *increase* their export prices. If the resulting increase in prices of these commodities dominates any fall in coal prices (appropriately weighted to reflect export shares), the terms of trade will improve, amplifying the benefits of a coal productivity improvement.

Thus, in Scenario 3 (the high productivity scenario), black coal industry expansion generates a terms of trade improvement because the increase in export prices of some major commodities dominates a small decline in the coal export price. When the fall in the coal price is assumed to be larger, however, as in Scenario 4b, the terms of trade decline. This occurs for two reasons. First, because of the direct impact on the export price of coal, and second, with black coal industry expansion moderated because of lower coal prices, the real exchange rate effect, which squeezes other export industries, is also smaller. Contraction of the latter industries is smaller and, consequently, so too is the increase in their export prices.

M.6 Labour and capital markets

M.6.1 Labour market

In the results presented in Appendix L, it was assumed that, in the long run, aggregate employment did not deviate from the rate of growth forecast in the base case. In other words, a productivity improvement in the black coal industry was assumed to have no impact on the level of employment in the economy by 2009–10, the last year of the period examined. Ultimately, the gain from higher productivity was distributed to workers in the form of higher real wages.

Underlying this closure of the model is an assumption about the operation of the Australian labour market — namely, that higher real wages, in the long run, do not encourage additional labour supply. In effect, a 'natural' rate of unemployment is invariant both to demand and supply shocks.

The 'natural' rate of unemployment, or NAIRU,[3] is defined usually as the rate of unemployment consistent with steady (non-accelerating) inflation.

[3] Non-accelerating inflation rate of unemployment.

Essentially, it is the mirror image of the equilibrium rate of employment in the economy, given factor supplies and productivity. Any attempt to reduce unemployment via monetary or fiscal policies (which indirectly reduce the real wage and push workers off their labour supply curve) will have only temporary effects. In the long run, workers will restore the real wage, at the natural rate of employment, output and unemployment.

In theory, the natural rates of unemployment and employment are sensitive to supply (real) shocks which affect the productive capacity of the economy and the supply of and/or demand for labour. But here the conjecture is that, in line with observed stickiness of the unemployment rate (sometimes called 'hysteresis'), even supply shocks do not generate employment growth in the long run.

This is a pessimistic view of the Australian labour market, suggesting that even permanent improvements in the productive capacity of the economy will not reduce unemployment. It is possible, however, that long-run labour supply is responsive to increases in real wages. In this case, a productivity improvement can generate sustained increases in both employment and real wages, though the real wage increase will moderate as employment expands. If employment increases permanently, GDP will increase in the long-run beyond the results presented in Appendix L.

M.6.2 Capital market

For capital, one approach is to assume that the supply of capital is fixed in each industry and that rates of return adjust in response to changes in industries' prospects. This is consistent with a short-run view because it takes time to invest and adjust the quantity of capital.

Alternatively, the rate of return in an industry can be predetermined, reflecting a view that, over time, rates of return (adjusted for risk) in the economy, and internationally (reflecting the international mobility of capital), will tend to equalise. In this case, the quantity of capital in the economy and in each industry adjusts in response to changes in their prospects.

If the level of capital in the economy increases in response to productivity improvements in the black coal industry, GDP increases to a greater extent.

In the MONASH analysis, it is assumed that, in the short run, the level of capital is fixed in each industry. Consequently, in the short run, rates of return vary. In the long run, however, the capital stock adjusts and rates of return resume their normal levels. This is consistent with internationally mobile capital in the long run.

Given the MONASH assumptions about short and long-run adjustment in the labour and capital markets, a productivity improvement in the black coal industry generates greater capital intensity in the economy over time. While this increases GDP, a smaller increase in real wages coupled with employment growth would deliver even greater benefits.

M.7 The nature of the productivity shock

The productivity shock imposed on the model in Scenario 3 is 'neutral' in the sense that capital and labour productivity each improve (or deteriorate) by the same percentage amount. This means that the relative factor intensity of the black coal industry does not change compared with the base case.

This means that additional output in the Australian black coal industry is produced using capital and labour in the same proportions as before the change, although less of each factor is required to produce each unit of coal. If the induced increase in coal output is large enough, additional capital and labour will be employed by the industry.

It is possible that a productivity change will be biased towards one factor. For example, if the productivity change 'saves' capital relative to labour, the production process becomes more labour-intensive and expansion of the industry would generate a comparatively stronger demand for labour.

It is difficult to estimate the extent of any net bias of feasible productivity changes in the black coal industry given the wide range of existing work and management practices which impinge on both labour and capital productivity. Essentially, this is why the Commission chose to model a neutral productivity change.

However, there is evidence that work and management practices historically, have promoted the adoption of capital-intensive techniques, and investment in capital-intensive sites, increasing the capital intensity of the industry overall. Removal of such practices could moderate this trend, encouraging relatively more intensive use of labour in the black coal industry.

M.8 Sectoral adjustment and adjustment costs

Expansion (or contraction) of one industry, particularly a major industry such as coal, will induce adjustment and restructuring throughout the economy. As explained in Box L.5 (Appendix L), in the case of a productivity improvement in coal (and assuming no significant fall in the export price), the initial export

surplus arising from increased coal exports will, via real exchange rate appreciation, squeeze other producers of tradeables in the economy — that is, export and import-competing industries. In addition, increased demand for labour by the black coal industry will tend to raise labour costs throughout the economy. This also will squeeze industries which cannot pass on higher costs — namely, industries exposed to foreign competition.

On the other hand, some industries, along with the black coal industry itself, will benefit from black coal industry expansion. Service industries generally benefit from higher national income, consumption and investment, while service industries that supply inputs to the black coal industry fare especially well.

These adjustments imply that growth, job opportunities and profitability in some industries will be lower relative to the base case scenario, and higher in others. Importantly, however, no broad industry sector is projected to experience negative growth (in terms of annual average output growth relative to current output levels), even with a very large expansion of the Australian black coal industry. But these industries will offer fewer job opportunities relative to the base case. Balancing this loss of opportunities, employment opportunities will open up in other industries. In order to gauge net welfare effects, any adjustment costs associated with the restructuring should be subtracted from the real consumption gains estimated in the productivity growth scenarios.

If productivity in the black coal industry is lower than in the base case (as in Scenario 2), job losses in that industry are estimated to be higher. This means that workers formerly employed in coal will need to find jobs elsewhere in the economy. In this no productivity growth scenario, new jobs will be created in other (mainly export and import-competing) industries, but displaced workers will incur adjustment costs. These costs should be added to the welfare losses estimated in Scenario 2.

It should be noted that, in reality, the structural adjustments following productivity change in the black coal industry will occur in the context of a dynamic economy. To the extent that other industries accelerate their productivity growth (relative to base case productivity growth), another set of structural adjustments would be set in train and combine with those ensuing from changes in black coal industry productivity. In short, in a dynamic economy, productivity changes and other shocks generate continual and pervasive structural adjustment and associated costs.

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BENCHMARKING CONSULTANCY

The terms of reference for this inquiry requested the Commission to report on benchmarks of productivity performance of Australian black coal mines compared with best practice in comparable international black coal mines and in analogous Australian metalliferous mines.

After calling for expressions of interest, and considering proposals from eleven firms, the Commission contracted Tasman Asia Pacific (Tasman) to undertake a benchmarking study. The Executive Summary of Tasman's final report is reproduced on the following pages. A copy of the full report has been sent to those who made submissions to the inquiry and is available on request from the Commission's Melbourne office, or on the Commission's website at http://www.pc.gov.au.

During the course of the inquiry the Commission held two separate workshops at which work in progress on the Tasman study was considered. The Commission engaged John Daly, a Director of ACIL Consulting, to open discussion at each workshop and to comment on the work in progress. A copy of Mr Daly's comments follows the Tasman Executive Summary.

Workshop participants also raised the following points as possible further qualifications to the Tasman findings:

- for those mines where both dragline and truck and shovel operations were benchmarked, the disparity in performance between the two operations may be explained by mines assigning the primary role of overburden removal to the dragline and a secondary, or supporting role, to the truck and shovel operation;
- the ratio of overburden to coal can influence the measured performance of truck and shovel operations where coal is transported on better formed roads and over longer distances than overburden; and
- it is not realistic to expect the *average* performance of a large sample of Australian black coal mines, which includes a number of acknowledged poorly performing mines, to compare favourably with a small sample of *better performing* United States black coal mines.

TASMAN
ASIA
PACIFIC

BENCHMARKING THE PRODUCTIVITY OF AUSTRALIA'S BLACK COAL INDUSTRY

TASMAN ASIA PACIFIC Pty Ltd

June 1998

EXECUTIVE SUMMARY

In October 1997 the Industry Commission contracted Tasman Asia Pacific to undertake a benchmarking study of the productivity performance of Australia's black coal mines. Tasman's brief was to benchmark mines in Australia's black coal industry against world best practice coal mines and best practice Australian metalliferous mines. The Commission will use this benchmarking in its current inquiry into the international competitiveness of the Australian black coal industry.

This report builds on earlier benchmarking work undertaken by Tasman. It benchmarks 44 separate mine operations in 1996 and 1997 — 22 truck and shovel, 13 dragline and 9 longwall operations.

Data used in this benchmarking study is based on information collected from a Tasman survey. The Australian mines invited to participate in the study were selected from a Barlow Jonker (1997) database. This database provides labour productivity and mine cost data separately for dragline, truck and shovel and longwall operations. Mines selected provided a representative coverage of mines exhibiting high, medium and low labour productivity. Tasman also aimed for representative coverage according to company ownership, location and mine technology. The black coal mines selected in the United States included a number that were nominated by industry experts as better practice operations as well as mines that were affiliates of Australian mining companies. Responses were received from 20 Australian black coal mines, eight United States coal mines and four Australian metalliferous mines. Black coal production from the responding Australian coal mines is equal to nearly 40 per cent of Australia's raw black coal production.

Tasman's benchmarking is based on total factor productivity measures (which measures total output relative to *all* inputs used) and supported by partial productivity measures to identify the drivers of productivity differences between mines.

The benchmarking analysis focuses on the main components of the mining process. However, it does not cover all mine inputs nor does it cover development work (eg setting up mine offices, developing access roads). The main items excluded from all three mining technologies are washeries, mine overheads, many maintenance activities and some materials used in production.

These elements have been excluded because:

- the data is often not supplied on a consistent basis by mines (eg mine office overheads and materials);
- the data vary considerably from year to year (eg due to the extent of major equipment overhauls in maintenance activities); and
- differences in inputs largely reflect geological or environmental factors (eg the yield of coal impacts on washeries input).

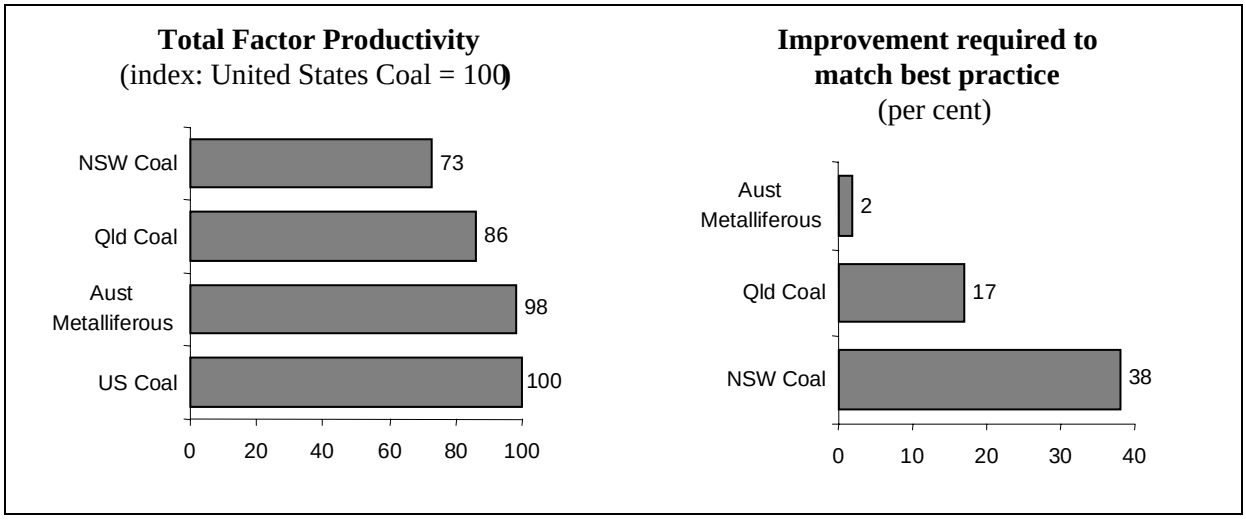
The analysis presented in this report has benefited from comments received from participants at the January 1998 and June 1998 benchmarking workshops that were conducted by the Productivity Commission in the course of its public inquiry process.

TRUCK AND SHOVEL PRODUCTIVITY BENCHMARKS

Truck and shovel mines remove both overburden and coal or other minerals primarily with trucks and shovels.

Tasman's benchmarking results indicate that in 1996–1997, the total factor productivity of the participating NSW and Queensland truck and shovel coal operations was, on average, well below best practice (Figure 1).

Figure 1: **Total factor productivity of truck and shovel operations**



Source: Survey undertaken by Tasman Asia Pacific (1998).

To match the best practice productivity levels of United States coal mines, participating NSW and Queensland coal mines needed, on average, to increase their productivity by 38 and 17 per cent respectively. Average productivity increases of 35 and 14 per cent, respectively, were required for these mines to match the average productivity of the Australian metalliferous mines covered by the survey. As a whole, the Australian coal mines in our sample needed to increase productivity by about 30 per cent to match the performance of the United States coal mines and Australian metalliferous mines.

A number of factors influenced these productivity outcomes. Geological conditions, such as thinner and more numerous coal seams in the NSW mine category explain some of the measured productivity gap. Of much more importance, however, were over-staffing, over-capitalisation of equipment and poor work practices. These were reflected in low relative labour and truck productivity in our sample of NSW and Queensland coal mines. For example, labour and truck productivity both needed to increase by around 70 per cent in the NSW coal mines to match the performance of our sample of United States coal mines. Queensland coal mines in our survey sample, on average, needed a corresponding 40 per cent increase.

However, a number of Australian truck and shovel operations are at the frontier of efficient operation — achieving productivity levels more than 50 per cent higher than many other Australia mines. Table 1 and Table 2 outline differences in key characteristics of the frontier and moderately performing Australian truck and shovel operations included in our sample. These characteristics indicate ways for the poorer performing mines to improve efficiency.

Table 1 indicates that over-staffing and over-capitalisation are common causes of lower productivity. Often the moderate performing mines have more equipment than they need — resulting in low equipment utilisation and productivity and requiring additional staff. In such mines, excess staff are also often apparent in areas such as operating non-core equipment (eg water and lube trucks) and in general duties.

Table 1: **Resourcing and work practices of typical best practice and moderately performing Australian truck and shovel coal mines**

	Best practice mine	*Moderately performing mine*
Total productivity	100	60
Resource levels		
Staffing levels: ratio of labour hours worked to equipment hours worked	1.5	2.1
Work time in shifts: time excluding leaving and joining shifts, meal and other breaks (per cent)	92	85
Utilisation of truck fleet: hours operated as a percentage of total available hours	45	40
Utilisation of major digging equipment: hours operated as a percentage of total available hours	50	40
Work practices		
Hot seat changes	✓	✓
Meal breaks in the field	✓	✗
Staggered meal breaks	✓	✗
Operators move between equipment within shifts	✓	rarely
Haulage equipment fuelled in breaks	✓	✗
Clean-up equipment does not impede production	✓	✗

Source: Survey undertaken by Tasman Asia Pacific (1998).

Work practices are more efficient in the high performing mines in the sample. For example, staff in efficient mines use effective hot-seat changes, take meal breaks on machines, stagger meal breaks to ensure that core equipment continues to operate, move between pieces of equipment within shifts where necessary, fuel haulage equipment during breaks and ensure clean-up equipment does not impede production. Generally the poorer performing mines in the sample implement only a few of these good practices.

Table 2: **Key attributes of typical best practice and moderately performing Australian truck and shovel coal mines**

	Best practice mine	*Moderately performing mine*
Efficient truck loading practices: incidence of double-sided or other efficient truck loading method (per cent)	>50	0
Spotting time of trucks under shovels (seconds)	35	65
Truck loads per shovel per 8-hour shift	185	135
Industrial disputes: days lost per thousand hours worked	0	20
Safety: lost time injuries per million man hours	20	50

Source: Survey undertaken by Tasman Asia Pacific (1998).

Highly productive truck and shovel operations often use efficient shovel techniques such as double-sided loading of trucks. This was supported by our survey findings, albeit based on a relatively small sample of mines (Table 2). While double-sided loading imposes an extra dimension of care to maintain safety standards, it allows substantially more excavation per shift and improves truck productivity. For example, based on our sample, spotting times under trucks (the time from assigning away the previous truck to dumping the first load in the next truck) are often around 35 seconds with double-sided loading compared to 65 seconds with single-sided loading. This 30 second per truck lost digging and transportation time is significant given the frequency of truck loading.

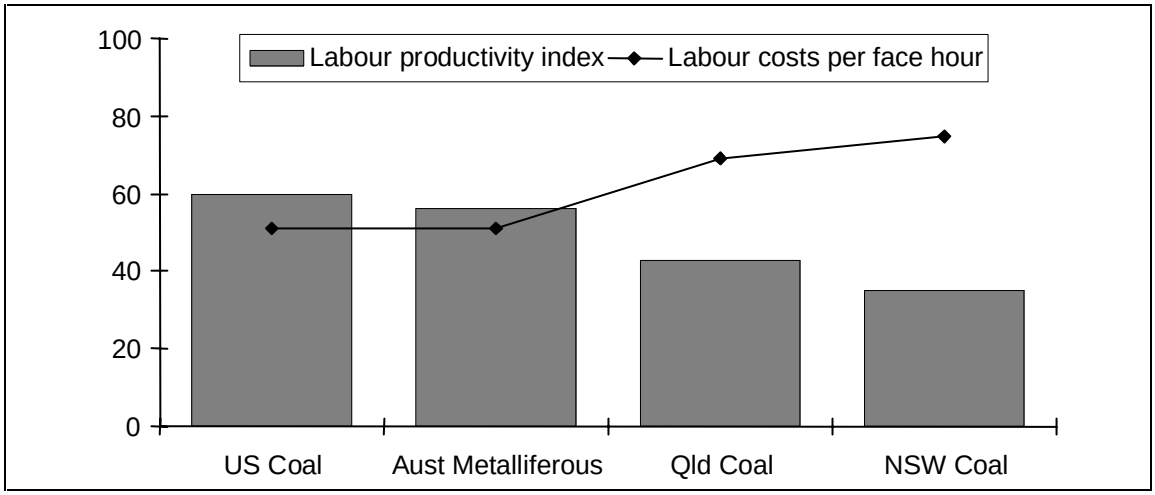
Better performing mines in the survey sample invariably had fewer industrial disputes and also seemed to have a better safety record.

PRODUCTIVITY AND COST OF TRUCK AND SHOVEL OPERATIONS

Our analysis of mines in the sample showed that the cost of material extraction and transport to stockpiles in NSW and Queensland truck and shovel operations was around 50 per cent higher than the United States coal mines and 30 per cent higher than the Australian metalliferous mines. Most of this was due to low productivity while about 30 per cent of the cost difference between the United States and NSW mines was due to high unit costs — especially of labour.

As shown in Figure 2, the average cost per face hour worked in the sample mines was considerably higher in the NSW and Queensland coal mine categories than in the Australian metalliferous and United States coal mine categories. These higher labour costs are in sharp contrast to the poor labour productivity achieved in these mines.

Figure 2: **Labour productivity and cost in truck and shovel operations** (index: United States Coal = 60 and $A costs)



Source: Survey undertaken by Tasman Asia Pacific (1998).

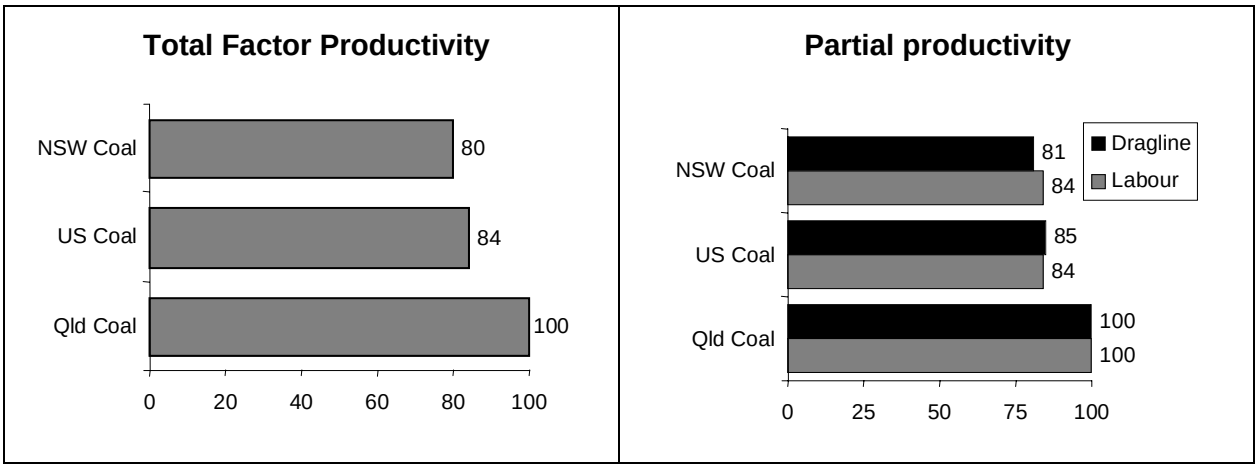
DRAGLINE BENCHMARKS

Tasman's estimates of dragline productivity focused on overburden removal in 13 open cut black coal mines located in NSW, Queensland and the United States. The results of this benchmarking see Queensland mines in the sample as the most efficient performers in 1996–1997 (Figure 3). NSW and United States producers in the sample needed to improve total productivity by an average of 25 and 19 per cent, respectively, to equal the Queensland mines' performance. On average, the productivity of the participating Australian dragline operations was about 13 per cent higher than the United States operations.

High dragline and labour productivity helped the sample of Queensland mines achieve this best practice result. Several factors contributed to the observed differences in productivity, across the sample, including:

- high dragline capacity utilisation coupled with operational efficiency of draglines in Queensland mines;
- low dragline operational productivity in New South Wales mines; and
- low blasting requirements in Queensland mines due to the geology of the overburden.

Figure 3: **Total factor productivity and key partial productivity of dragline operations** (index: Queensland = 100)



Source: Survey undertaken by Tasman Asia Pacific (1998).

Table 3 shows that the Queensland mine category achieved the highest operational efficiency, achieving 47 full dragline bucket equivalents per hour. This compared to 44 in the United States mines category and only 37 for sample mines included in the NSW category. The sample mines in the NSW category were not making effective use of their relatively large draglines. The main problem related to the average number of swings per hour. It appears that a number of these NSW mines achieved high dragline bucket factors.

Based on our sample, labour productivity in Queensland dragline operations exceeded that in NSW and United States mines by about 20 per cent. Much of this difference stemmed from the greater operational efficiency of the Queensland draglines and fewer staff being required for drilling and blasting activities. Work practices appeared to be generally good throughout the Australian and United States dragline mines.

Despite the good productivity performance of many of the Australian dragline operations in the sample, they achieved cost levels well above their United States counterparts. For example, total costs of removing overburden in participating Queensland mines were 23 per cent higher than in participating United States mines, even though productivity was 19 per cent higher in the Queensland mines — which helps to reduce costs. The higher input costs in the Australian sample mines were largely due to the high cost of labour and explosives.

While the number of responses was relatively small, our analysis suggests that a number

of Australian open-cut mines that have problems with over-staffing and inefficient work practices in their truck and shovel operations are able to achieve much higher relative productivity in their less labour-intensive dragline operations.

Table 3: **Productivity performance of dragline operations**

	Dragline output per hour (bcms)	*Bucket factor* (per cent)	*Swings per hour* (number)	*Bucket capacity* (loose cubic metres)	*Equivalent dragline bucketfuls* (number per hour)
Queensland coal	1 901	92	51	41	47
United States coal	2 074	88	50	47	44
NSW coal	1 910	95	39	51	37

Source: Survey undertaken by Tasman Asia Pacific (1998).

LONGWALL OPERATIONS

We have compared the performance of seven Australian longwall mines against two United States mines. Due to the fewer number of participating mines, these findings may not be as representative of the relative performance of the Australian industry as were the results of the truck and shovel and dragline surveys. This benchmarking analysis focuses on longwall operations, and excludes development work.

Our total factor productivity analysis indicates that the Australian longwall mines studied achieved productivity levels, on average, 20 per cent behind that achieved by longwall operations in the United States (Figure 4). Alternatively, the participating Australian longwall mines needed to improve productivity by an average of around 25 per cent to match the performance of the participating United States mines.

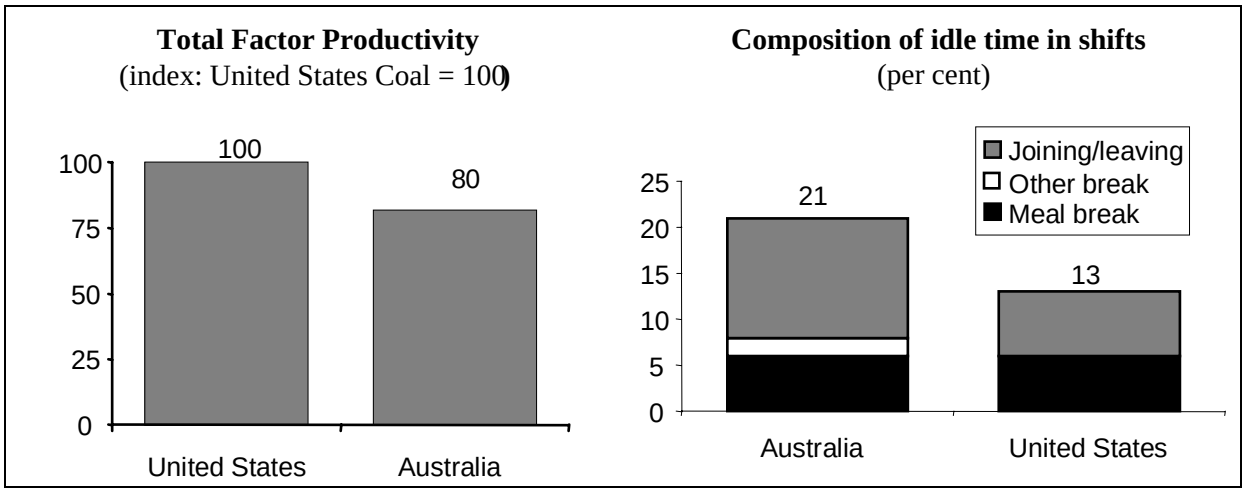
This lesser productivity performance mainly stemmed from:

- higher idle times in shifts in the participating Australian longwall mines;
- low utilisation of shearers in these Australian longwall mines; and
- geological differences.

The relatively high idle time in longwall shifts in the participating Australian mines was mainly due to longer times in joining and leaving shifts (Figure 4). Together with extra crib breaks, this reduced labour productivity in these Australian longwalls by about 10 per cent compared to the two United States mines. Other causes of lower labour productivity in these Australian longwalls related to operating conditions, installed

equipment and, most likely, an element of over-staffing.

Figure 4: **Total factor productivity and extent of idle time in shifts of Australian and United States longwall mines**



Source: Survey undertaken by Tasman Asia Pacific (1998).

Low shearer productivity in our sample mines resulted from lower utilisation in Australian longwalls. Some of this was due to planning — with spare capacity brought in to allow quicker longwall transitions. This was successful to a point, although there was evidence that a number of participating Australian mines took much longer to achieve target production on new longwalls than the United States mines. There was also apparent over-capitalisation of face-conveyor capacity in a few of the participating Australian longwall mines.

Longwall production costs were higher in the seven Australian mines, on average, than in their United States counterparts. Most of this reflected the productivity differential, although labour costs were also higher in these Australian mines compared to the United States mines.

While the sample of longwalls was small, it was again evident that Australian mines can attain or approach world's best practice productivity performance. One of the Australian mines was only about 10 per cent below the best practice United States mine, which is an acknowledged efficient operator. This was over a period that was not particularly favourable for the Australian mine.

MAJOR FINDINGS

The results of Tasman's black coal mine benchmarking indicate a very mixed productivity performance by Australian black coal mines in our sample. In each of three main technologies examined — truck and shovel, dragline and longwall — Australia can boast a number of mines that are at or very close to world best practice performance levels. Based on our sample, the problem for the Australian coal industry is the large number of moderate and poorly performing mines. However, this suggests that the better practice Australian mines often provide excellent benchmarks for the many, less-efficient Australian mines.

This is especially the case for Australia's truck and shovel mines, which needed to improve productivity by an average of around 30 per cent to match better practice United States coal mines and Australian metalliferous mines. A large proportion of Australian truck and shovel operations in our sample needed to improve total productivity by over 50 per cent to match their "best practice" neighbours. The poor productivity mines typically suffered from over-staffing, over-capitalisation and poor work practices.

Despite the smaller sample, a similar story emerged from the analysis of longwall mines. The analysis suggests that Australia has outstanding longwall mines but also many moderate performers. To approach best practice, the poorer performing Australian longwall mines need to decrease the extent of idle time in shifts, increase equipment utilisation and decrease the time taken to achieve full production on new longwalls.

In contrast, Queensland's dragline operations, as a sample group, were identified as best practice, operating at productivity levels around 20 to 25 per cent higher than similar mines in the United States and NSW samples. This good productivity performance was consistently achieved in the Queensland operations and appeared due to good engineering, management and labour practices.

In summary, the sample of mines included in the benchmarking study, suggests that the performance of mines in the Australian black coal industry is mixed. The varying levels of performance are now mainly due to problems at the company or mine level rather than industry level.

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BENCHMARKING PERFORMANCE IN THE BLACK COAL INDUSTRY — DISCUSSION OPENER — PRODUCTIVITY COMMISSION SEMINARS

Tasman Asia Pacific's report for the Commission *Benchmarking the Productivity of Australia's Black Coal Industry,* like its precursor *The scope for productivity improvement in Australia's open cut black coal industry,* commissioned by Rio Tinto, is at once an indictment of the industry's performance in 1996 — at least in the truck and shovel segment — and a pointer to identifying the improvement opportunities that clearly do exist.

The purpose of this paper, which was presented at the Commission's two seminars on benchmarking, was to provide an introductory comment and critique on the benchmarking work.

Productivity is not an easy concept — unless it's constrained to apply to a single operation with unchanging technology. Tasman defines it as "a measure of the physical output produced from the use of a given quantity of inputs". The only way to hold the denominator in this ratio constant and measure the numerator consistently — against changing or different circumstances, different technologies and different scales — is to derive indexes which comprehend all outputs and inputs, their values and costs, and weight them appropriately. The ratio indicates "total factor productivity".

There is still a question as to whether the measures used in this analysis are sufficiently comprehensive of coal mining activities to be fully representative of them. In particular, the exclusion of most maintenance activities and the exclusion of development work in longwall mining would appear to detract from the TFP concept. Alternatively, the benchmarking work undertaken by Tasman might better be described as addressing various sub-sets of mining activities: "truck and shovel operations", "dragline operations" and "longwall operations".

In concept, TFP attempts to measure output physically (what the mine does — or what it did at a certain time), with the *levels* of resource endowments (and ease of mining), technology employed, scale economies, and the mix and relative prices of all the various inputs held constant. This is what TFP relies on; it can do so rigorously using index number theory if the factor cost shares are not too different. Doing it thoughtfully and carefully is the hard part.

It is always important to remember that productivity — TFP or partial — is not an end in itself (though TFP can get very close to economic performance and competitiveness). Productivity measures are diagnostics. They can help, by

"looking over the fence", to indicate how an operation might be able to "get more for less".

Partial productivity figures (and less than comprehensive TFP figures) are interesting in highlighting differences, and useful in understanding or inferring reasons for differences in TFP. However, all the pertinent circumstances need to be taken into account before it would be sensible to act on the basis of partial productivity indicators. South African mines, for example, have much higher physical inputs of labour than competitors here and in the US — exactly as one would expect with lower unit labour costs and a profit maximising objective. The Tasman report explains that large wage differences preclude the suitability of Indonesia, South Africa and Chile from TFP comparisons with Australia. Also, Tasman's results suggest that the US coal mines in the survey have got it right by over-providing shovel capacity (rather than wrong as the partial indicator might imply), because they achieve much better haulage performances.

TFP is also limited to some extent. For example, when exchange rates move significantly, as they have recently, it would be surprising if the ideal composition of inputs in different countries were not to change. One would expect, for instance, increased emphasis on imported vehicle and equipment maintenance in Indonesia (and Australia), and on substituting local inputs like maintenance in place of foreign capital imports. On the other hand, relatively low real costs of capital at the moment would tend to induce capital spending. Just what the implications of such price changes are for TFP analysis over time is a question that might appropriately be addressed.

The other thing to recall is that, as Tasman cautions, this work is confined to certain activities on the mine side of the mine gate. Competitiveness is so critically dependent as well on the cost of getting the final product to market — notably the price (ie the terms and conditions) of rail access and haulage, port services and ocean transport. This is something the Productivity Commission is well aware of — though many will be inclined to hope that the final report devotes more attention to the contestability of the terms of rail access.

It would not be prudent to make too much of the precision of the Tasman results — especially given the relatively small sample sizes (with quite disparate observations) and possibly inconsistently measured or misunderstood data. None of these comments should be taken to imply that the Tasman work is in any way unreliable, rather that it might be wise to round off many of the numbers and put something of a (subjective) margin of error around them — and this is also Tasman's view. The consultants have, in a couple of places, calculated the rough implications on the TFP estimates of different values for partial figures — and that approach is commended.

Perhaps the most pressing question relates to the appropriateness of using total material excavated and transported as the measure of total output. No question, it is more realistic in terms of measuring the activity undertaken at a coal mine than just counting coal produced. For example, if I read the averages data correctly, say in truck and shovel, the selected mining costs per tonne of coal produced are $2 or $3 in Queensland and about $10 in NSW. That's a huge disparity. When the big difference in strip ratios (overburden to coal) is taken into account, the disparity in costs is substantially reduced (and NSW doesn't look nearly as bad). Even so, total costs incurred at the mines are considerably higher than these figures — emphasising again the importance of being concerned about how comprehensive is the TFP measure adopted.

As previously mentioned, maintenance is a topic that also engenders some unease in relation to Tasman's indicators. The scale of the maintenance function at an open cut coal mine — elsewhere as here — is always impressive. And yet its coverage in the analysis is implicit and maintenance staff, where identified, are excluded. The report provides some figures on the relative scale of the maintenance function — though it is not clear what size is a "typical" mine.

Maintenance is, in effect, subordinated to the object of mining coal. However, this begs the question: isn't mining overburden in the same category? It isn't an end in itself, but rather, like maintenance, just a necessary means to accessing the coal. If the activity were out-sourced (as it sometimes is) would it be treated differently? And would it matter?

In relation to truck and shovel, Tasman has analysed 22 mines in all, including 5 US coal mines and 4 Australian hard rock mines. The reported ratio of coal, in total material excavated, in NSW mines is a low 10%, compared with 30% for Queensland and 40% for the US. While the identities of the participating coal mines are properly protected, one might guess that Queensland includes Blair Athol and maybe NSW includes some of the deeper open cuts. The question has been raised as to how representative all this is, given the relatively small total tonnage surveyed. Again the issue is: to what extent does it matter? Significantly, if the NSW overburden removal task was indeed smaller, the productivity result for NSW mines would be even worse.

One might also question the quality of the data on replacement cost of equipment items. And what exchange rate was used to convert the US capital costs to $A? Do taxes on these capital items affect the figures?

Irrespective of these queries, however, the Tasman's findings reflect an unsatisfactory situation. The Tasman results suggest Australian truck/shovel mines lag far behind their US counterparts in productivity and mining costs; equipment is clearly over-manned; truck utilisation is poor; turnaround times are slow; and idle time is excessive.

As to the reasons for these deficiencies, the Tasman study proposes that many of them are due to work practices and working arrangements. Some of these links are self evident — and material presented elsewhere in the Commission's report tends to confirm that often asserted relationship.

Not all the results reported by Tasman are bad: in draglines, the surveyed Queensland mines established best practice. Also, in some of the categories where the average productivity performance of Australian mines appeared to be wanting, some individual mines ranked much more highly.

However, as noted above, the report card overall is poor. Specific diagnostics, and prescriptions for improvement, necessarily demand attention to the partial indicators — and some of those reported in the study are particularly impressive: in longwalls, the finding that Australian miners, compared with their US counterparts, spend 30 minutes extra joining and leaving shifts is indicative of important differences, if not immediately of possible remedies. It is also instructive that safety appears to be a key productivity indicator: the lost time injury rate of 20 per million man hours at best practice mines compares with a rate of 50 at moderately performing mines.

The partial figures also lend credence to assessments of the scope for improvement: for instance, it is revealing that truckloads per shovel per 8 hour shift vary between 185 at best practice and 135 for moderately performing mines. Some of these indicators provide reassurance that Tasman's TFP estimates — which must be preferred for general assessment purposes — are reasonably reliable.

Ultimately, the quality and usefulness of the productivity comparisons, as Tasman is the first to acknowledge, is dependent on the selection of benchmarking partners whose operations are reasonably similar and on co-operation between them over time to ensure consistency of terminology, classification and measurement. Some of the better performing Australian mines might be very useful benchmarking partners for the poorer performers.

JOHN DALEY
Director
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