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Mining the Labour Market: The Estimated Demand for Labour in the SA Mining Sector 2006-2014

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Director's Note

Welcome to the eighteenth issue of *Economic Issues*, a series published by the South Australian Centre for Economic Studies as part of its Corporate Membership Program. The scope of *Economic Issues* is intended to be broad, limited only to topical, applied economic issues of relevance to South Australia and Australia. Within this scope, the intention is to focus on key economic issues – public policy issues, economic trends, economic events – and present an authoritative, expert analysis which contributes to both public understanding and public debate. Papers will be published on a continuing basis, as topics present themselves and as resources allow.

The authors of this paper are Michael O'Neil, Director and Paul Huntley, Research Assistant, SA Centre for Economic Studies.

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Michael O'Neil
Director
SA Centre for Economic Studies
April 2006

Mining the Labour Market: The Estimated Demand for Labour in the SA Mining Sector 2006-2014

Overview

Soaring global resource demand has led to a significant increase in investment in the mineral sector in South Australia, and in many other parts of the country. This 'mining boom' has been widely reported in the media.[1]

This paper presents a summary of commissioned research undertaken by the South Australian Centre for Economic Studies on behalf of the State Government, for the purpose of estimating the additional labour requirements due to the planned expansion of mining in this State. After briefly outlining the size of the industry in economic terms, the paper then describes the survey and estimation methodology used to quantify the labour requirements, followed by the estimated demand in the mining sector by occupational grouping and finally, we draw some conclusions.

In Appendix A to this paper, we include an estimate of the combined employment demand for mining, and the heavy engineering and maintenance services sector in the Upper Spencer Gulf. These combined estimates resulted from a second study conducted by the Centre, wherein we examined the demand for skilled labour, arising from economic growth, the impact of retirement and labour turnover, in the heavy engineering sector. The estimates in the Appendix extend only to 2010 for "all mining and GMUSG"[2] as the study for the heavy engineering sector only collected data (by face to face interviews and survey) out to 2010.

Data on expenditure on mineral exploration in South Australia confirm, that the South Australian mining industry has entered a significant expansion phase. This is without taking into account the prospects for the mining and export of uranium from South Australia, which have recently been advanced with trade deals with China and potentially, India. While mining sector employment will increase certainly, it is not a labour-intensive industry. However, it provides high-wage employment, the industry has the highest labour productivity of any Australian industry and mining exports are significant in terms of Australia's trade balance.

The Centre developed a Major Projects Estimation Model 2005 that enables input of the number of direct employees in South Australia associated with major mining and resource processing projects, that then provides the following outputs:

- the total gross employment requirement;
- the estimated gross requirement at 4 digit ASCO level;
- the estimated gross requirement by the VET sector; and
- a summary of the increase in employees by industry.

Direct employment in the mining sector for all respondents is expected to rise from 3,720 to 7,600 persons by 2010 and to peak at 8,900 in 2011-12. It is likely that the total workforce of the companies surveyed will more than double out to 2011-12 and thereafter decline as the major construction phase at Olympic Dam nears completion. The workforce is likely to grow at an annual average growth of 7.6 per cent out to 2014.

The demand for skilled tradespersons will increase by approximately 800 persons (8.9 per cent per annum). The three occupational groups, tradespersons, intermediate production and transport workers, and labourers and related workers, represent 74 per cent of the workforce in 2005 and this will rise to 80 per cent by 2010 (and 78 per cent by 2014). Indirect employment is estimated at a further 13,200 employees, so that total employment generated in South Australia is in the order of 17,200 persons out to 2014.

The total training requirement for "other VET qualifications" is estimated at 3,990 persons with 37 per cent of this group (1,459) classified at trades and related workers (see Table E.1).

Table E.1
Occupational Classification and Training Requirement 2005-2014

ASCO	Occupational Classification	Total Gross Requirement	Requirement - Other VET
1000	Management Employees	1,421	303
2000	Professional Employees	2,647	178
3000	Business & Administration, Assoc Prof	2,069	573
4000	Trades and Related Workers	2,441	1,459
5000, 6000, 7000	Misc. Clerical Workers	4,573	718
7000	Intermediate Production & Transport	2,482	536
9000	Labourers and Related Workers	1,554	223
Total		17,188	3,990

Note: In addition, approximately 1,000 persons would require a Diploma or Advanced Diploma.

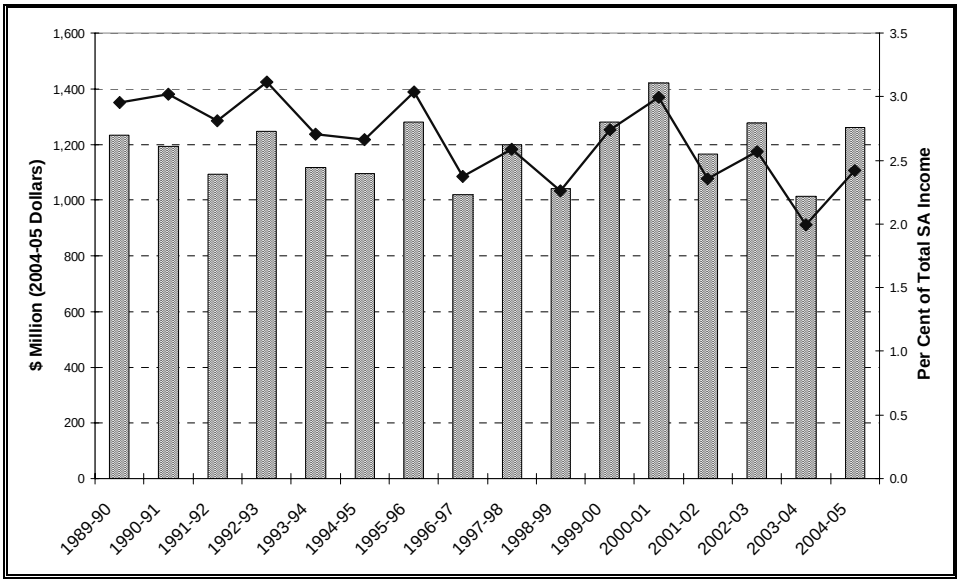
1. Introduction: The South Australian Mining Industry

The South Australian mining industry is a relatively small component of the State economy. In 2004-05, mining generated income of $1,260 million in South Australia, which represented only 2.4 per cent of the total income from all industries in this State ($52,093 million).[3] By comparison, mining generated 8.2 per cent of State income in Queensland, and 21.4 per cent in Western Australia.

... real mining income and share of State income ... steady

In real terms, the income from mining in South Australia, and its share of total State income, have remained roughly the same over the past 15 years. This is illustrated in Figure 1, with the columns showing real mining income (adjusted to 2004-05 dollars to compensate for inflation) and the line showing the percentage of total State income.

Figure 1
South Australia – Real Mining Income and Share of Total State Income



Source: ABS Cat. No. 5220.0 - *Australian National Accounts: State Accounts*, 2004-05, Table 27.

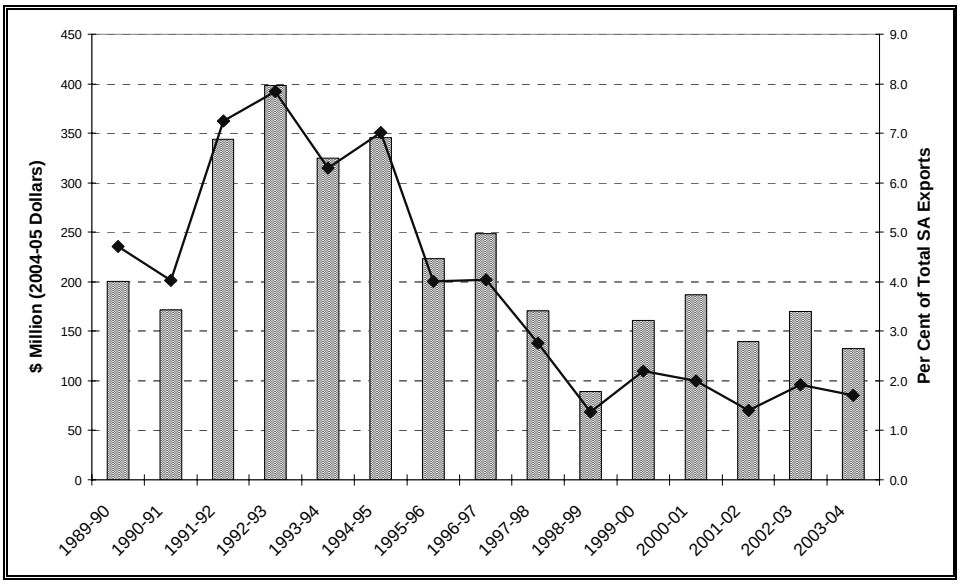
The contribution of mining to State exports is illustrated in Figure 2, with the columns showing real mining exports from South Australia (adjusted to 2004-05 dollars) and the line showing the percentage of total State exports. ('Exports' here refers only to overseas exports, not interstate trade.)

... only 2 per cent of State exports in 2003-04 ...

In 1992-93 mining represented almost 8 per cent of State exports, but declined to under 2 per cent by 2003-04 (the last year for which we have State export data). Since mining income remained steady over this time, it follows that a larger share of mining product has been used as a factor of production within South Australia, or elsewhere in Australia, rather than being directly exported.

Mining's low proportion of State exports in the last few years is also a consequence of the export success of other industries, particularly wine and motor vehicles.[4]

Figure 2
South Australia – Real Mining Exports and Share of Total State Exports



Source: ABS unpublished data.

... the mining industry is in an expansion phase ...

The charts above give no indication of the 'mining boom' mentioned in the introduction. This is because they are based on data from the Australian Bureau of Statistics, which is available up to Financial Year 2004-05 (in the case of income) or 2003-04 (in the case of exports). The South Australian mining industry is in an expansion phase: existing projects are enlarging their capacity, and new projects are being planned and preparing infrastructure. An impressive surge in production will result, but is still some years down the track.

However, the start of the 'mining boom' is reflected in mineral exploration spending, illustrated in Figure 3, which spiked upwards in 2004-05 to $67 million – the highest level in 15 years.

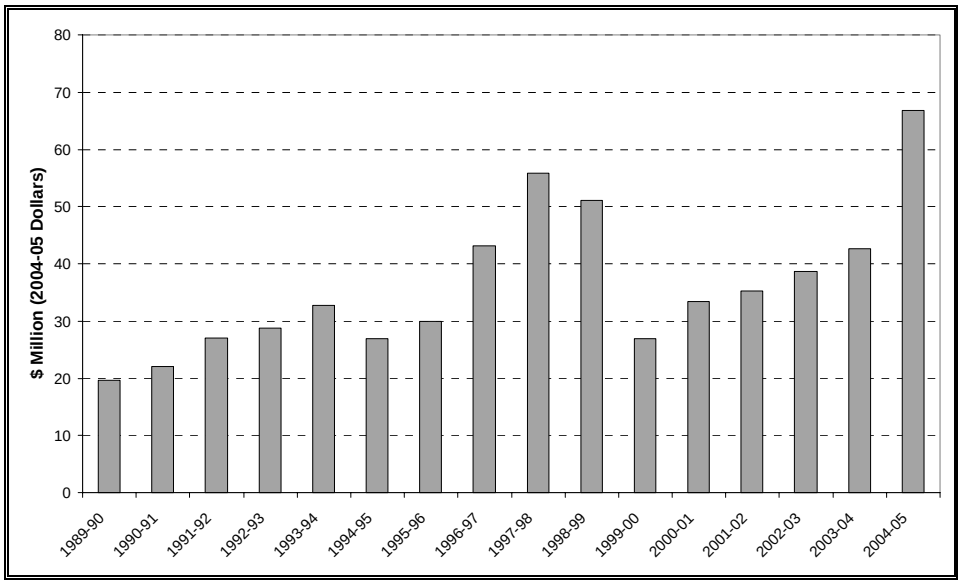
In Section 3 of this paper, the Centre's estimates for mining industry employment are set out. For 2006, the Centre projects an average of 5,090 mining-related jobs in this State. It should be noted that this is only a small component of the overall State labour market – just under 1 per cent of total full-time employment in South Australia.[5] Mining is not a labour-intensive industry.

... high wage employment and career paths ...

Nonetheless, mining employment is important because it creates high-wage jobs with good career paths. The vast majority of jobs in the mining industry are full-time,[6] and, as of November 2005, average weekly earnings for full-time mining workers was $1,671.00 (compared to $1,078.50 for full-time workers across all industries).[7]

In part due to its high capital-to-labour ratio, mining has the highest labour productivity of any Australian industry. Table 1 shows each industry's gross value-added, number of employed persons (expressed as full-time equivalents), and labour productivity.

Figure 3
South Australia – Real Mineral Exploration Expenditure



Source: ABS Cat. No. 8412.0 - *Mineral and Petroleum Exploration, Australia,* Table 4.

Table 1
Australia – All Industries – Value Added, Employment and Productivity

	Gross Value Added ($ million)	Employed Persons ('000 FTE)	Labour Productivity ($/FTE)
Mining	36,025	112.6	319,903
Electricity, Gas and Water Supply	18,943	77.0	245,994
Finance and Insurance	58,567	329.2	177,882
Communication Services	23,790	178.0	133,669
Wholesale Trade	42,066	385.4	109,151
Property and Business Services	99,020	971.5	101,922
Manufacturing	96,013	999.7	96,045
Transport and Storage	38,688	413.9	93,470
Agriculture, Forestry and Fishing	26,778	296.9	90,206
Government Administration and Defence	33,528	418.3	80,149
Construction	53,283	774.7	68,783
Health and Community Services	52,064	770.7	67,552
Education	37,005	549.2	67,382
Cultural and Recreational Services	11,765	208.6	56,399
Accommodation, Cafes and Restaurants	18,359	346.0	53,060
Retail Trade	52,415	1,070.3	48,971
Personal and Other Services	15,012	326.1	46,036

Note: figures as at June 2005.
Source: ABS Cat. No. 5206.0 - *Australian National Accounts: National Income, Expenditure and Product,* Dec 2005 and 6291.0.55.003 - *Labour Force, Australia, Detailed, Quarterly,* Feb 2006 and SACES calculations.

... skill requirements pose a challenge ...

Though mining's labour needs are relatively modest compared to other industries, they present a unique challenge due to remoteness of some mining operations and the skill sets required. In meeting this challenge, the first step must be to attempt to forecast the industry's labour requirements in the short- to medium-term.

The next section of this paper discusses the methodology of estimating the demand for labour in the South Australian mining industry.

2. Estimating Demand for Labour in the Mining Sector

2.1 Scope of Project Methodology

In 2005, the South Australian Centre for Economic Studies was commissioned by State government agencies to survey a list of mining companies, provided to the Centre by Primary Industries and Resources South Australia. The Centre was requested to document the employment requirements of individual companies and to gather other information relevant to the future employment, education and training demands of the exploration, mining and minerals resource sector (e.g., timing of the project, capital investment, etc.). The Centre added to the list of companies, NRG Flinders at Leigh Creek and Project Magnet at OneSteel Whyalla. The companies invited to participate in the study are shown at Table 2.

Table 2
Mining Survey: South Australia 2005

Adelaide Resources	Iluka Resources
Australian Zircon	Minotaur Exploration
Beach Petroleum	NRG Flinders
BHP Billiton	OneSteel (Whyalla)
Dominion Mining	Oxiana
Exco Resources	Santos
Havilah Resources	Southern Cross Resources
Heathgate Resources	Stuart Petroleum
Helix Resources	Terramin Australia Ltd
Hillgrove Resources	

The Centre provided to each company a survey questionnaire which sought information on the following:

- organisation and contact details, mine name and location;
- timing of the project, including exploration, feasibility assessment, construction and operations;
- life of the mine, capital cost and estimated annual level of production ($A);
- information on contractors for construction and on-going operations, location of contracting firms;
- staffing of the mine or project site, critical skill requirements;
- expectations relating to the employment of apprentices; and
- use of contractors, where they would also require tradespersons and semi-skilled workers.

From survey returns, information from annual reports and the Australian Stock Exchange, newspaper reports and company prospectus, the Centre compiled an extensive dataset on employment, investment, mining activity (current and planned), financial estimates and mining operations.

At a later date to assist with workforce planning issues, the Centre distributed a second survey seeking information on occupations by 4-digit ASCO codes (standard occupational classifications) under broad titles of manager, professionals, associate professionals, trades and related workers, clerical workers, production and transport and labourers and related workers. The survey provided for separating out the initial development and construction phase of the mining operation (and employment requirements) from extraction and on-going operations.

2.2 Factors to Consider in Analysis of Employment and Training

... timing of the construction phase ...

The timing of individual mining projects will influence the demand for skilled labour within any economy; for example, it is anticipated that the construction phase of Project Magnet at Whyalla, the mine site at Prominent Hill (Oxiana) and that for the Angas Zinc Project at Strathalbyn by Terramin Australia Ltd will have been largely completed before the commencement of construction at Olympic Dam. In addition, the employment profile and management of construction and mining activities can be quite different from operations/production, so that training requirements need to adjust to long-term demand (i.e. to reflect the life of the mine). Table 3 provides an illustration of the difference between the aggregate employment profile for construction and that for mining/mineral processing activities.

Table 3
Employment Profile for Construction and Mining Activities

Classification	Construction	Mining/Production
Managers & Administrators	1.7	5.0
Professionals & Assoc. Professionals, Technicians	8.7	35.0
Tradespersons and Related Workers	68.6	21.0
Clerical	2.3	3.0
Labourers, production & Transport Workers	18.6	36.0
Total	100.0	100.0

Source: SACES estimates based on survey returns and WA Minerals Institute Workforce Profile.

Employment trends in the mining sector "are cyclical, dependent (among other factors) on commodity prices, state of reserves, intensity of exploration as well as employment needs at the stage of operations, of different commodity developments (for example, exploration followed by extraction)"[8] or construction to full operations. For instance, gold reserves worldwide have been declining so that the price of gold is anticipated to exceed $A800 an ounce in 2006 encouraging further exploration and mining.

The occupational structure of employment also varies across commodity/product type. Semi-skilled, trade and professional (e.g., metallurgists, mineral refining) predominate in the mining and processing of gold. Overall, the resources sector demands competence in mechanical (diesel) trades, electrical trades and experienced mining operatives in plant, machinery and equipment, haulage and transport. Professionals in mining engineering in the construction and the operations stage of the development of a mine and resource processing are in high demand, reflected in high starting salaries, particularly in very remote areas.

In a review of Census 2001 occupations by employment in the mining sector, DFEEST noted the following:

> "... most people are in "ordinary" occupations not in specialist mining occupations. They may work in an atypical environment but by and large they are transport workers, plant operators, office workers, electricians and so on. ... there are probably fewer than a thousand people in identifiably mining specialist occupations. Secondly, most are in relatively low skill areas, that is, overall the level of technical skill required by the industry (or at least that part of it which can be impacted by external training providers) is not high relative to other industries. In fact, many of the occupations are common to many industries". (DFEEST: Draft discussion paper, Mining Industry Snapshot).

We concur with this view. Indications of employment provided in survey returns for the occupations of labourers and related workers (ASCO: 7000), and intermediate production and transport workers (ASCO: 9000) for three current mining operations[9] averages 58 per cent of the total workforce, while for three proposed new mining operations is expected to exceed 62 per cent.[10]

2.3 Major Impacts Estimation Model

The Centre developed a Major Projects Estimation Model 2005 that enables input of the number of direct employees in South Australia associated with major mining and resource processing projects, that then provides the following outputs:

... information from the model for planning purposes ...

- the total gross employment requirement;
- the estimated gross requirement at 4 digit ASCO level;
- the estimated gross requirement by the VET sector;
- a summary of the increase in employees by industry; and
- further detail on occupations by industry.

A second estimation model requires the value of production in $A (millions) in South Australia associated with each project to be entered into the model. The projected annual level of production once the project is fully operational enables an estimate of the gross impact of employment resulting from the project, both in terms of its direct effect,

and also its indirect effects. A large project that is coming to the end of its operational life can also be entered as a negative value to provide an idea of the scale of employment that is likely to be displaced.

... some importing of workers with specific mining experience ...

It is worth noting that many large projects source a significant proportion of their labour force from outside the State. In the case of mining and oil exploration, employees experienced in various types of mine development, construction or type of deposit (e.g., experience with mineral sands) are in demand to ensure the appropriate levels of skills and experience. Therefore, this type of calculation is only indicative. The Centre consulted with companies to assess the number and types of employees they are intending to source in South Australia, thus providing greater robustness to the estimates.

The breakdown by qualifications is a guide to potential additional qualified persons required in the labour force and represents necessarily a static view of the economy's skill requirements. That is, it is calculated on the current distribution of skills within occupations. This may vary as a result of higher output from the training sector or higher rates of inward migration. Higher retirement rates which are an obvious implication of an ageing workforce could also impact on the economy's skill requirements.

Finally, the model's estimates include all support staff (in the tradition of the ABS), wherein for ABS data, up to 15 per cent of employees in mining are non-production professionals. In some cases, up to 30 to 40 per cent of employees could be 'away from the mine'.

In the next section of this paper, the Centre presents estimates out to 2014 for the labour requirements of the mining sector. There remains a degree of uncertainty concerning the size of the Olympic Dam workforce and exactly when it is most likely to commence operations. However, we express a degree of confidence about the estimates for the mining sector in terms of gross numbers required due to the intended scale of operations that BHP Billiton envisages at Olympic Dam and the quality of data provided to us.

... combined estimates for mining and heavy engineering ...

In Appendix A, we present combined estimates for the mining sector and the heavy engineering sector in the Upper Spencer Gulf region. Figures for the latter are taken from a survey of labour demand in heavy engineering firms for the period 2005 to 2010.

3. Estimated Demand

Here we consider the results from the mining survey and estimated employment out to 2014.[11] Table 4 summarises the growth in direct employment in mining for 2005 out to 2014 by ASCO 4 digit level occupational classification. Total employment in construction and operations is expected to grow at an annual average rate of 7.6 per cent[12] representing an increase of 94 per cent on current employment for the projects surveyed. Current employment levels in the mining sector are estimated to rise from 3,720 persons to 8,900 persons by 2011 and thereafter decline to 7,200 by 2014.

... over 5,000 additional employees over the next five years to 2011 ...

Table 4a
Employment in the Mining Sector, 2005-2009

	2005	2006	2007	2008	2009
Management Employees	61	64	65	58	58
Professional Employees	312	375	390	379	387
Business & Admin - Assoc Professionals	357	367	382	386	385
Trades and Related Workers	654	920	921	830	1,028
Misc Clerical Workers	87	94	105	101	104
Intermediate Production and Transport	1,265	1,372	1,387	1,385	1,606
Labourers and Related Workers	817	968	920	903	1,173
Employee Numbers	3,552	4,165	41,82	4,055	4,754
Additional Contractors	167	925	1,078	628	521
Total	3,719	5,090	5,260	4,683	5,275

Table 4b
Employment in the Mining Sector, 2010-2014

	2010	2011	2012	2013	2014
Management Employees	60	70	70	70	71
Professional Employees	392	413	407	397	399
Business & Admin - Assoc Professionals	412	416	419	459	462
Trades and Related Workers	1,589	2,164	2,016	1,394	1,413
Misc Clerical Workers	109	115	118	121	123
Intermediate Production and Transport	2,697	3,037	2,937	2,552	2,587
Labourers and Related Workers	1,822	2,156	1,716	1,586	1,615
Employee Numbers	7,094	8,384	7,696	6,592	6,683
Additional Contractors	521	521	521	521	521
Total	7,615	8,905	8,217	7,113	7,204

... two peaks in the construction phase of mining projects ...

Construction employment is expected to grow strongly over the five years to 2010, but particularly during 2006 and to peak in 2007, and thereafter to peak in 2011-2012 with final construction at Olympic Dam. Companies involved with construction during this time include Australian Zircon, Oxiana, Terramin, Iluka, Hillgrove, OneSteel and Thiess (for OneSteel) and Stuart Petroleum. The construction phase for several of these projects and the conversion project at OneSteel will most likely be finalised prior to major developments at Olympic Dam, so that by the second half of 2008 there seems likely to be an opportunity for labour mobility.

The demand for skilled tradespersons will increase by 116.0 per cent or at an annual growth rate of 8.9 per cent per year; labourers and related workers by 7.3 per cent per year and intermediate production and transport workers by 7.9 per cent (CAGR).

The three occupational groups, tradespersons, intermediate production and transport workers and labourers and related workers represent 74 per cent of the workforce in 2005 rising to 80 per cent by 2010, before declining thereafter (2014: 78 per cent). This is consistent with the employment profile referred to in Table 2 as a mining project moves from the construction phase through to full operations. Skilled tradespersons represent 18 per cent of the workforce in 2005 rising to 21 per cent in 2010, and thereafter decline to 20 per cent by 2014.[13]

Direct non-mine site employment is approximately 21 per cent of total employment.

A total of approximately 5,200 additional employees will be required for the mining, oil and gas and mineral resources processing sector over the period 2005 to end 2011 when the construction workforce is likely to peak. The estimates are subject to the caveats referred to earlier, particularly that the full extent of the BHP Billiton Olympic Dam workforce and the exact date of full-scale operations are not known, nor how many skilled workers are likely to be attracted to South Australia over the period.

... by 2011, one adult retires and one young worker enters the workforce ...

On this last point, South Australia has enjoyed recent success in attracting migrants who are issued a visa under State-specific or regional migration mechanisms. In 2003-04 South Australia received 16.3 per cent (= 2,750 persons) of skilled migrants under targeted programs, while one year later this had increased to 26.5 per cent of State-specific visa and regional migration programs (= 4,950 persons). This will need to be maintained over the next 5 years to supplement a declining intake of young workers into the labour force. For example, by 2011 for every school leaver entering the labour force one adult will retire across the three Provincial Cities of Port Augusta, Port Pirie and Whyalla.

Notwithstanding, we have not discounted the estimate of the total demand for labour for either inward migration or for some proportion of the labour force to be sourced from outside the State (through specialist contractors).

... total employment to increase by 17,200 out to 2014.

Total additional direct employment over the period 2005 to 2014 is estimated to average 4,000 persons, given a degree of uncertainty about the size of the BHP Billiton workforce post the end of the construction phase and the timing of this. Indirect employment from consumption and production induced impacts flowing from expansion of the mining sector, is estimated at approximately 13,200 additional employees, so that total employment generated in South Australia is 17,200 out to 2014.

Table 5 provides a summary by occupational classification (ASCO) of the gross requirement for the major occupational grouping and the estimated contribution of the VET sector to training employees in each of the classifications. It can be seen from Table 5 that a significant number of

tradespersons will be required and that there is likely to be strong competition in the labour market for those with a trade qualification. Higher retirement rates for an ageing workforce will exacerbate the shortage of skilled tradespersons. The future demand for selected occupations and trade skills is summarised in Table 7.

Table 5
Occupational Classification and Training Requirement 2005-2014

ASCO	Occupational Classification	Total Gross Requirement	Requirement - Other VET
1000	Management Employees	1,421	303
2000	Professional Employees	2,647	178
3000	Business & Administration, Assoc Prof	2,069	573
4000	Trades and Related Workers	2,441	1,459
5000, 6000, 7000	Misc. Clerical Workers	4,573	718
7000	Intermediate Production & Transport	2,482	536
9000	Labourers and Related Workers	1,554	223
Total		17,188	3,990

Note: In addition, approximately 1,000 persons would require a Diploma or Advanced Diploma.

Table 6 illustrates the employment distribution by industry sectors and the number of employees.

Table 6
Employment Distribution by Industry Sectors, 2005-2014

Sector	Number of Employees	Sector	Number of Employees
Agriculture, Forestry & Fisheries	292	Communication Services	408
Mining	4,402	Finance and Insurance	591
Manufacturing	1,864	Property & Business Services	2,188
Electricity, Gas, Water	152	Government Admin & Defence	556
Construction	395	Education	462
Wholesale Trade	830	Health & Community Services	491
Retail Trade	2,326	Cultural & Recreation Services	268
Accomm, Cafes & Restaurants	582	Personal and Other Services	459
Transport and Storage	921	Total	17,188

... other industry impacts ...

Table 7 lists the gross requirement for the top ten VET trained occupations by ASCO code and title out to 2014.

Table 7
Future Demand for Selected Skilled Trades and Occupations 2005-2014

ASCO	Qualification	Estimated Gross VET Requirement
4112	Metal Fitters/Machinists	263
4211	Motor Mechanics (Diesel)	152
4311	Electricians	145
7911	Miners	133
4122	Structural Steel/Welders	97
8211	Sales Assistants	95
1222	Production Managers	79
7311	Truck Drivers	66
3129	Other Building/Engineering Associate Professional	61
7123	Engineering Production System	58

4. Conclusion

... majority are trade, professionals and para professionals ...

Direct employment resulting from the 'mining boom' is estimated by the Centre to average 4,000 persons over the period 2005 to 2014. This is not a large number in context of the overall State labour market, currently generating over half a million full-time jobs. The significance of this labour requirement is that the majority of these positions involve trade, professional, or para-professional skills that are already in short supply. Furthermore, this labour demand may have a significant positive impact on regional areas where unemployment has historically often been very high. On the other hand, higher wages in the mining sector will help to attract employees to mining locations and this may contribute to skill shortages in other regional areas. Already, some have voiced concern about this later effect.[14]

The key to managing the boom is to provide the right training in the right locations. In our report to the State Government earlier this year, we stated:

> "An important outcome [of our report] is the expectation of strong competition in the labour market for skilled trades and experienced mine workers and a desire by all companies to work closely with government to improve enrolments and outcomes in pre-vocational courses. There is broad support for an identifiable (badged!) skills training centre, built on close co-operation between industry and government."

... brokering new skills and training opportunities ...

The newly re-elected Government made a commitment in its election platform for a Skills Centre that will act in a planning and coordination role for mining and heavy engineering skills. The platform stated:

> "We will establish the Mineral Resources and Heavy Engineering Skills Centre. The Centre will work in partnership with industry, and education and training providers, to forecast what skills will be needed by the minerals and mining sector, and by when.
>
> The Skills Centre will act as a one-stop-shop for industry. It will help coordinate schools, TAFEs, universities and other education and research bodies to engage industry in developing solutions to its workforce needs. The Centre also will work to secure funding from industry, and the Commonwealth, to complement the State's investment."[15]

It will need to be a priority of the Government to get this Centre operational quickly, and to sort out funding arrangements with the Commonwealth Government and industry.

Appendix A

Employment Requirement for GMUSG and Mining

Global Maintenance Upper Spencer Gulf (GMUSG) is a group of companies specialising in heavy engineering and an array of maintenance services. GMUSG commissioned SACES in 2005 to prepare a projection of their labour requirements out to 2010.

There is considerable overlap between the skills required by GMUSG and those required by the mining sector. They are drawing workers from the same segments of the labour market. So it is useful to project the total labour demand of GMUSG and mining.

... combined mining and heavy engineering sectors ....

To aggregate the mining study and the workforce requirement for GMUSG group of companies we removed data for OneSteel, NRG Flinders and Santos from one set of estimates. In Table A.1 the occupational groups were 'collapsed' into five categories to match the classifications used in the GMUSG report. The data for the combined mining and heavy engineering sectors can only be extended to 2010 as data for GMUSG was only collected out to 2010.

Table A.1
All Mining and GMUSG: 2005-2010

	2005	2006	2007	2008	2009	2010
Managers & Administrators	152	160	164	161	165	170
Professionals & Assoc. Professionals	806	884	919	917	929	967
Tradespersons and Related Workers	1,242	1,529	1,552	1,483	1,703	2,288
Clerical	192	203	218	217	225	234
Labourer, Production & Transport Workers	2,845	3,131	3,125	3,135	3,655	5,426
Employee Numbers	5,238	5,908	5,978	5,913	6,678	9,085
Additional Contractors	167	925	1,078	628	521	521
Total	**5,405**	**6,833**	**7,056**	**6,541**	**7,199**	**9,606**

... even stronger demand for skilled trades ...

The growth rate of employment increases from that for all mining (7.6 per cent) to 12.2 per cent with tradespersons and labourers/semi-skilled growing most strongly at 13.0 per cent and 13.7 per cent respectively. Up to 18,000 additional employees will be required out to 2010, as shown in Table A.2 by industry sectors.

... significant role for the VET sector ...

Table A.3 shows the estimated demand for qualifications – a Diploma or Advanced Diploma and those who will require an "other VET qualification" – representing approximately 23 per cent of the total employment requirement.

Table A.2
Gross Increase by Industry Sectors: Mining and GMUSG, 2005-2010

	Gross Increase in Employees
A Agriculture, Forestry and Fishing	307
B Mining	4,624
C Manufacturing	1,958
D Electricity, Gas and Water Supply	160
E Construction	415
F Wholesale Trade	872
G Retail Trade	2,443
H Accommodation, Cafes and Restaurants	611
I Transport and Storage	968
J Communication Services	429
K Finance and Insurance	621
L Property and Business Services	2,299
M Government Administration and Defence	584
N Education	485
O Health and Community Services	516
P Cultural and Recreational Services	282
Q Personal and Other Services	482
Total	18,056

Table A.3
Training Requirement out to 2010

	Total Gross Requirement	Requirement - Advanced Diploma/ Diploma	Requirement - Other VET
1000 Managers and Administrators, nfd	1,493	171	318
2000 Professionals, nfd	2,781	238	187
3000 Associate Professionals, nfd	2,174	291	602
4000 Tradespersons and Related Workers, nfd	2,564	78	1,533
5000 Advanced Clerical and Service Workers, nfd	4,804	273	754
7000 Intermediate Production & Transport Workers, nfd	2,607	56	563
9000 Labourers and Related Workers, nfd	1,633	31	234
Total	18,056	1,138	4,192

... opportunity to reduce youth and indigenous unemployment in the Upper Spencer Gulf ...

In the report for GMUSG we estimated total demand for Tier 1 companies (the 6 largest employers) and Tier 2 GMUSG companies would increase by 1,255 persons to 2010 and by 1,818 persons for the Upper Spencer Gulf economy as a whole.

In conclusion, if the mining projects proceed in the timelines provided to the Centre, if employment recruitment is achieved at the rate and number of persons specified, and BHP Billiton accelerates construction at Olympic Dam in 2009 with full operations in 2013, and without any of the "emerging mining"[16] projects to commence construction prior to 2010, then we estimate total employment demand will be some 18,000 persons out to 2010.

... total employment up to 18,000 persons by 2010 ...

End Notes

[1] See, for example, "Mining boom brings glory back to bush", *The Advertiser*, 25 February 2006.

[2] GMUSG: group of heavy engineering and maintenance companies under the title Global Maintenance Upper Spencer Gulf.

[3] ABS, *Australian National Accounts: State Accounts*, 2004-05, Table 27, Cat. No. 5220.0.

[4] For further details, see SACES Issues Paper 14 (2005), *South Australia's Overseas Exports.*

[5] The most recent quarterly Labour Force Survey estimates that there were 513,300 full-time employed persons in South Australia in February 2006. ABS Cat. No. 6202.0 – *Labour Force, Australia*, Feb 2006.

[6] At least 95 per cent of mining jobs in South Australia are full-time. It is difficult to know exactly what the percentage of part-time jobs is, since there are so few of them that the ABS survey figures are subject to sampling variability too high for most practical purposes.

[7] ABS, *Average Weekly Earnings, Australia*, Table 10H, Cat. No. 6302.0.

[8] Minerals Institute of Western Australia, "People and Skills Requirements in 2015", September 2005.

[9] Olympic Dam, Challenger and NRG Flinders Leigh Creek.

[10] Oxiana at Prominent Hill, Iluka and Terramin.

[11] Important caveats to the estimates include the following:

- BHP Billiton have not yet been able to provide an up-date to their earlier employment estimates and it is likely that employment estimated at 4,500 persons could be higher around 2013-14;
- the Challenger and Beverley mines are likely to expand production with implications for employment;
- the construction workforce for Terramin in the period 2006-07 could not be provided;
- Oxiana expect to source some contractors from outside South Australia;
- new entrants to the South Australia labour market will reduce the gross requirement across all sectors of the economy; and
- the current construction workforce for several projects are included in 2005 estimates.

[12] CAGR: Compound Annual Growth Rate.

[13] Likely to underestimate actual number of skilled tradespersons employed as some with a trade qualification will be employed as truck drivers (e.g., diesel mechanics), supervisors and in other managerial or supervisory positions.

[14] "Skills crisis as workers move on", *The Advertiser*, 6 April 2006.

[15] Australian Labor Party SA Branch (2006), *Mining Policy*.

[16] Emerging mining projects were those identified by PIRSA where exploration is on-going and while some valuable mineral discoveries had been recorded, the projects were still in the very early stages of planning.