

WESTERN AUSTRALIAN Mineral and Petroleum STATISTICS DIGEST

2005-06



Department of
Industry and Resources

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WELCOME TO THE DEPARTMENT OF INDUSTRY AND RESOURCES' 2005-06 STATISTICS DIGEST.

This publication contains the most comprehensive statistical information available on the Western Australian minerals and petroleum industry.

The statistics in this Digest show that in 2005-06 the State's minerals and petroleum sector set a new record, rising by 29 per cent to reach \$43.2 billion. This follows a decade of average annual growth of more than ten per cent.

This record result was driven by strong overseas demand for our resources and rising commodity prices. Despite the robust nature of the industry, the year produced many challenges and the impressive result was achieved against a background of adverse weather conditions, skills shortages, mining equipment supply constraints together with some shipping bottlenecks.

The minerals and petroleum sector continue to remain the pillar of the State's economy accounting for around 30 per cent of Gross State Product, 80 per cent of its export income and around one-sixth of its employment.

Western Australia is one of the great mineral provinces of the world. It hosts an impressive 560 commercial mineral projects, embracing 1222 operating mine sites which produce over 50 different minerals. In 2005-06, there were also 67 operating oil and gas fields.

With mine and port expansions and anticipated continued strong demand, it is expected that the minerals and petroleum sector will continue its record-breaking run through 2006-07 and beyond.

It is not possible to prepare such a comprehensive range of information without assistance from outside the Department. I would like to thank the various resource companies, Australian Bureau of Agricultural and Resource Economics (ABARE), Australian Bureau of Statistics (ABS) and the Western Australian Treasury Department for their cooperation and help during the preparation of this Digest.

Jim Limerick
Director General



1. EXPLORATION AND INVESTMENT

1.1 Petroleum exploration

In 2005–06, total expenditure on petroleum expenditure in Australia grew by 15 per cent to \$1262 million. The majority of this expenditure, 72 per cent, was spent offshore. Also, ABS statistics indicate that around 64 per cent of the expenditure was on areas inside production leases. However, this needs to be interpreted with some caution as expenditure reported in areas outside production lease areas is not necessarily in green field, frontier-type territory.

Expenditure on petroleum exploration in Western Australia during the same period grew by three per cent to \$593.6 million. This represented 47 per cent of the national total and a decrease on 2004–05 when the share was 53 per cent.

In the ongoing endeavour to increase Western Australia's petroleum exploration, in September 2006, 16 new petroleum exploration permits in the State, worth \$347 million were announced. Twelve of these permits were for offshore exploration and have been granted in conjunction with the Federal Government. The other four permits were for onshore exploration and were offered to companies subject to native title and environmental processes.

The permits were for under-explored regions of the State that could contain sizeable gas or oil reserves and include investments by overseas companies.

Plectrum Petroleum from the UK will explore Western Australia for the first time, with two permits in the Bremer sub-basin off Western Australia's southern coast. Also, Perth company Oilex NL teamed up with four Indian companies and was granted a permit in deep water in the Northern Exmouth Plateau.

With the 12 additional offshore permits, Western Australia now has almost 100 petroleum exploration permits operating off its coast.

The 12 new offshore permits comprise:

- Shell Development (Australia) Pty Ltd and Chevron Australia Pty Ltd in the Carnarvon Basin, adjacent to the Scarborough gas field;
- Octanex NL and Strata Resources NL in the Southern Exmouth Sub-basin, southwest of the Enfield oil production area (two permits);
- Oilex NL, Gujarat State Petroleum Corporation Ltd, Videocon Industries Ltd, Bharat Petroleum Corporation Ltd and Hindustan Petroleum Corporation Ltd in deep water in the Northern Exmouth Plateau;
- Gascorp Australia Ltd in the Outer Exmouth Plateau in a deep water extension of Australia's major hydrocarbon producing basin;
- Cue Exploration Pty Ltd in the Northern Exmouth Plateau, northwest of the Mutineer–Exeter oil field;
- Gascorp Australia Ltd in the Northern Exmouth Plateau, northeast of the Jansz–Io gas discovery;
- Westralian Petroleum Ltd, Lempika Pty Ltd and Emphazise Pty Ltd in a proven petroleum system in the Perth Basin (two permits);

- Plectrum Petroleum plc in the Bremer sub-basin off southern Western Australia (two permits); and
- Woodside Energy Ltd in the Browse Basin, about 70 kilometres southwest of the Brecknock gas field.

The four new onshore permits are:

- Emerald Gas Ltd in the Canning Basin;
- Golden Dynasty Resources Ltd in the Canning Basin;
- Exceed Energy (Australia) Pty Ltd in the Canning Basin; and
- Uramin Pty Ltd in the Officer Basin.

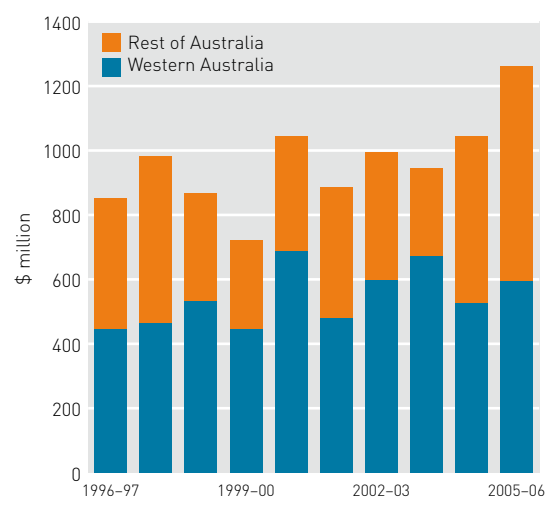


Figure 1 | **Petroleum Exploration Expenditure**
Source: ABS

1.2 Minerals exploration

While high commodity prices have driven up mineral production, mineral exploration expenditure has not been robust. In addition, Western Australia is experiencing falling mineral exploration expenditure, whereas the rest of Australia is at least showing some benefit from the current boom.

Australian mineral exploration expenditure in 2005–06 rose by 21 per cent from \$1028 million in 2004–05 to \$1241 million. However, despite the commodity boom and popular expectations, mineral exploration expenditure in Western Australia actually fell during 2005–06 by three per cent (\$16 million) from \$606 million in 2004–05 to \$590 million in 2005–06. This highlights the weakness of the so-called current boom in mineral exploration in Western Australia, where, in inflation-adjusted terms, expenditure has not yet reached the level of the previous boom in 1996–97.

Mineral exploration for the rest of Australia though is relatively strong and as a result, Western Australia's share of the national expenditure on mineral exploration fell sharply from 59 per cent in 2004–05 to 48 per cent, during 2005–06 and this share is now at its worst level for at least twenty years.

It is important to note also that although national mineral exploration expenditure was up by 21 per cent in 2004–05, mineral exploration drilling (metres drilled) was up by only one per cent. This reduces the chance of new discoveries and the resulting resources necessary for the long-term sustainability of the mining industry.

Turning to specific mineral commodities, in 2005–06, iron ore expenditure increased, but nickel and gold exploration declined. For example, iron ore exploration expenditure in Western Australia is still rising and increased by nine per cent in 2005–06, surpassing all previous records. On the other hand, State nickel exploration expenditure declined by 34 per cent in 2005–06 compared to 2004–05 and it appears exploration expenditure for nickel has passed its peak.

Gold exploration expenditure in Western Australia also declined, by 12 per cent in 2005–06 compared to 2004–05 and the long-term trends for gold exploration in the State are very disappointing, with high gold prices during 2005–06 doing very little in encouraging gold exploration activity. As a result, the proportion of mineral exploration expenditure channelled into gold in Western Australia has dropped dramatically over the last decade, from around 76 per cent of the total in the mid-1990s to only 41 per cent in 2005–06.

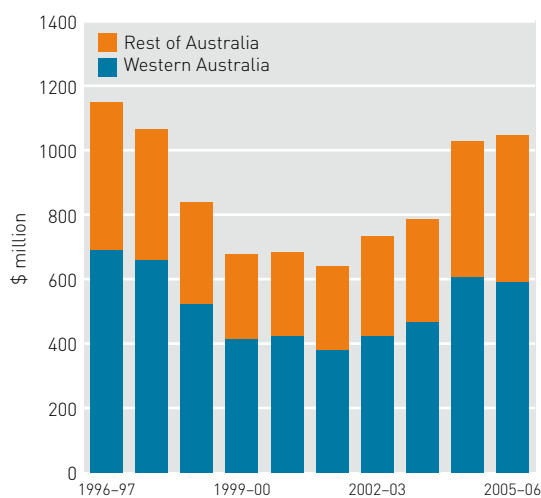


Figure 2 | **Mineral Exploration Expenditure**
Source: ABS

1.3 Investment

ABS private new capital expenditure statistics show a very significant rise in the value of new capital expenditure in the mining sector during 2005–06. In Western Australia alone, the total amount of capital expenditure on mining amounted to \$10.2 billion, which was an 84 per cent increase compared to the previous financial year. This also represented 64 per cent of Western Australia’s total (\$15.9 billion) new capital expenditure in 2005–06.

Total national mining investment in 2005–06 amounted to \$18.1 billion, an increase of 76 per cent compared to the previous financial year. In 2005–06, Western Australian accounted for around 56 per cent of the total national mining investment.

It is important to note that the figures reported above do not capture all mining investment as the ABS uses classifications specified in the 1993 edition of the Australian and New Zealand Standard Industrial Classification (ANZSIC) (ABS catalogue number 1292.0). Accordingly, mining is broadly defined as the extraction of minerals occurring naturally as solids such as coal and ores, liquids such as crude petroleum and natural gas. Downstream mining activities such as smelting of minerals or ores (other than preliminary smelting of gold) or refining are classified as manufacturing activities under the ANZSIC. Products such as coke and alumina are also included in the ANZSIC manufacturing category.

The Department’s databases indicate that there are more than \$69 billion worth of potential resource projects currently under construction or consideration for development in Western Australia. This includes large projects such as, for example, the Hope Downs iron ore mine and Ravensthorpe nickel mine and processing plant. A significant number of upstream petroleum projects are either underway or planned for the State over the next few years, totalling \$22 billion. These projects include committed expenditure on Woodside’s huge expansion of North West Shelf (NWS) upstream facilities, its Enfield, Stybarrow and Vincent oil developments plus its Browse and Pluto Liquefied Natural Gas (LNG) projects. Also included is committed expenditure by Chevron and Inpex on the Gorgon and Ichthys LNG developments.

Major petroleum-related projects underway:

- NWS 5th LNG train;
- NWS \$5-billion expansion of upstream facilities;
- Woodside’s \$1.5-billion Enfield, Vincent and Laverda oil and gas project; and
- Woodside’s \$200-million Goodwyn A low-pressure train.

Taking into consideration the total potential completed investment value of upstream petroleum projects either underway or planned for the State over the next few years, the value of these projects climbs to around \$35 billion. Associated with this is around 11 000 additional construction and 1400 full-time jobs. The projects are located mainly in offshore Commonwealth waters.

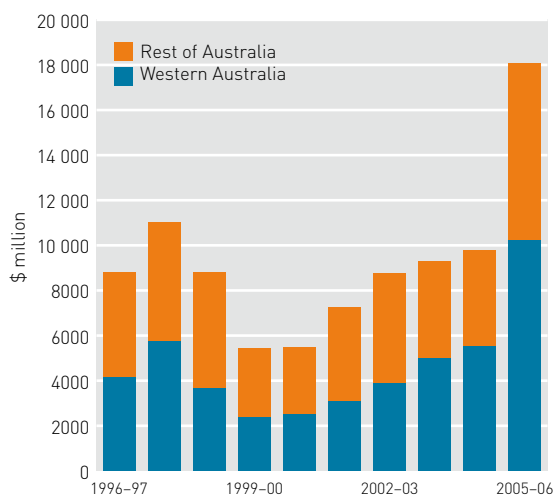


Figure 3 | **Mining Investment** Source: ABS

2. MINERALS AND PETROLEUM INDUSTRY 2005–06 REVIEW

2.1 Overview

In 2005–06, the value of Western Australia’s mineral and petroleum industry reached \$43.2 billion. This represented a 29 per cent increase compared to the previous financial year. The record result was achieved through high overseas demand for resources which has underpinned solid commodity prices. This strong result was also achieved against a background of adverse weather conditions in the first quarter of 2006 plus mining equipment supply constraints together with some shipping bottlenecks.

Whilst most of the State’s minerals and energy industries recorded higher sales quantities, the overall rise in value of sales for 2005–06 is mainly attributable to the significant increases in the value of the petroleum and iron ore sectors (23 per cent and 56 per cent respectively). These two industries accounted for around 65 per cent of the total value of \$43.2 billion for 2005–06.

Petroleum is the largest resource sector by value and an increase in sales of \$2.8 billion saw it reach a record level of \$15.2 billion. This was chiefly due to high world oil prices together with increased LNG shipments.

The next largest is iron ore and this giant of the minerals industry sold a record 244 million tonnes in 2005–06, valued at \$13 billion, an increase of four per cent and 56 per cent respectively. With mine and port expansions and anticipated continued strong demand, it is expected that this sector will continue its record-breaking run through 2006–07 and beyond.

Next in order of value to the State is alumina, with a sales value of \$4.1 billion (an increase of some 19 per cent compared to the previous period), followed closely by nickel at \$3.8 billion (up eight per cent) and gold at \$3.6 billion, up 18 per cent.

The base metals sector also performed particularly strongly with new projects coming on-stream, to record a 187 per cent increase and reach a total of \$821 million worth of sales. Diamonds recorded a 28 per cent increase in sales reaching a little over 29 million carats and salt sales of \$230 million, increased almost 13 per cent compared to the previous period.

An average of only half a percentage depreciation in the Australian dollar against the US dollar during the 12-month period to the end of 2005–06 had little influence on the outcome, which was driven by strong commodity prices and increased output by Western Australian producers. It is expected that the strong demand for the State’s resources by Western Australia’s trading partners will continue through 2006–07.

Some additional salient indicators of Western Australia’s significance in the national resource industry are that the State accounts for:

- approximately 50 per cent of Australia’s total value of mineral and petroleum sales (based on a DoIR estimate as no current total national value data is published);
- 67 per cent of Australia’s 2005–06 oil and condensate production (based on ABARE);
- approximately 50 per cent of mineral production (based on a DoIR estimate as no current total national value data is published); and
- 31 per cent of Australia’s total merchandise exports in 2005–06 (sourced from ABS).

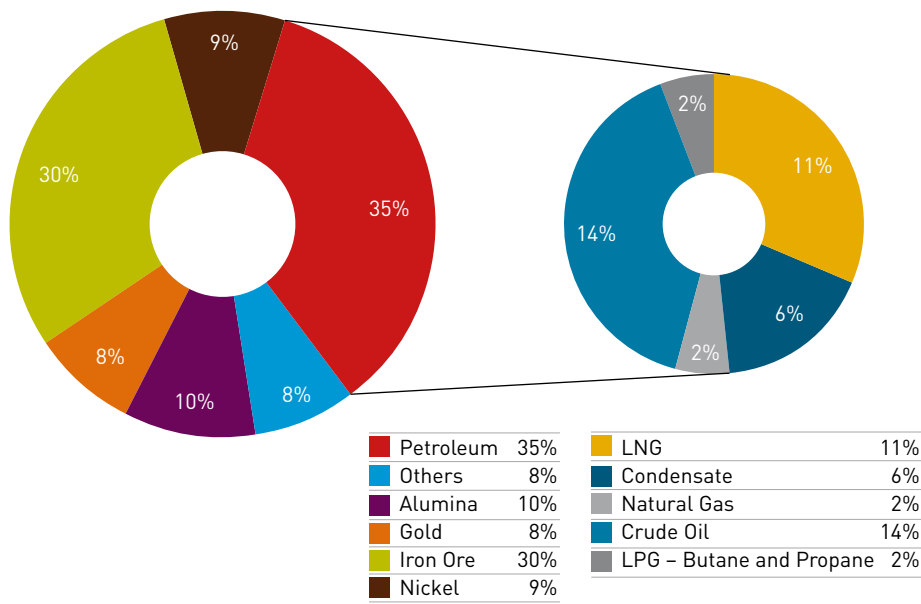


Figure 4 | Value by Commodity 2005–06 Source: DoIR

HIGHLIGHTS IN 2005–06

The Tapis oil price peaked in May at US\$78.79/bbl and averaged US\$66.51 per barrel during the 2005–06 financial year. Strong oil prices resulted in a 20 per cent increase in the value of crude oil to realise \$6.2 billion worth of sales.

LNG sale volumes rose by six per cent to realise a record sales value of \$4.9 billion, an increase of 24 per cent. This makes LNG the third most valuable individual commodity in the State after iron ore, and crude oil and condensate.

LPG butane and propane also enjoyed a healthy output increase of 12 per cent, returning a sales value of \$654 million, up 55 per cent. Natural gas remained relatively steady with a small increase in quantity sold of nearly one per cent and an increase of four per cent in value to reach \$703 million. Crude oil and condensate were the only two petroleum items to record lower outputs due to maturing fields; however, strong prices still resulted in a 22 per cent increase in value to \$8.9 billion.

Iron ore is now the largest individual mineral sector by value, accounting for 30 per cent of the value of resources output for 2005–06, up from 22 per cent in 2004–05. On the back of a 71.5 per cent increase in prices effective April 2005 and strong demand, particularly from China, iron ore reached a record sales value of \$13 billion in sales, based on 244 million tonnes of ore.

Alumina's steady performance over the years continued through 2005–06 to claim fourth place behind LNG. A modest output increase of three per cent resulted in a record 11.5 million tonnes being shipped and a respectable 19 per cent increase in the value of sales to reach \$4.1 billion.

Nickel output increased by six per cent to reach a record 191 000 tonnes, while the value of sales increased by eight per cent to reach a total of \$3.8 billion in 2005–06. This was a record for nickel and accounts for nearly nine per cent of the total value of resources.

Diamonds saw a resurgence of sale volumes with an increase of 28 per cent or 29 million carats. Reported production also increased, by 28 per cent to 32.5 million carats.

Gold output dropped marginally during 2005–06 by nearly four per cent to reach 5.2 million ounces (161 060 kg) and remains well below peak output levels achieved in the late 1990s. This sector also slipped into sixth place behind nickel with a value of \$3.6 billion despite strong gold prices which in May 2006 achieved an all-time record in Australian dollar terms of \$933.20 per ounce.

Base metals joined the record breakers by achieving a value of \$821 million for the 2005–06 period (a 187 per cent increase). This was achieved through strong commodity prices together with increased output from producers, the new Magellan lead mine coming on-stream and a full year's production from Telfer.

All base metal sectors performed well, with copper increasing in quantity by 15 per cent, recording 71 000 tonnes, while value increased by 65 per cent to \$403 million. Lead quantities soared to 59 000 tonnes, valued at \$87 million whilst zinc sales more than doubled to reach 108 000 tonnes and record a value of \$332 million.

Mineral sand sale values remained virtually static at \$800 million with sale quantities dropping in all categories except leucocoxene. Mineral sands' share of the overall total value of resources dropped from three per cent in 2004–05 to less than two per cent in 2005–06. Zircon however, despite recording a 12 per cent drop in sale quantities, achieved a nine per cent increase in sales value to \$327 million.

Salt achieved a 13 per cent increase in sales value for 2005–06 reaching \$330 million but tonnages were down by 7 per cent. Cobalt sales volumes rose by 13 per cent, however, weaker prices saw sale values declining by around nine per cent to \$183 million. Manganese tonnages increased by 46 per cent, but again, lower prices meant sales value remained little changed from last financial year at around \$118 million.

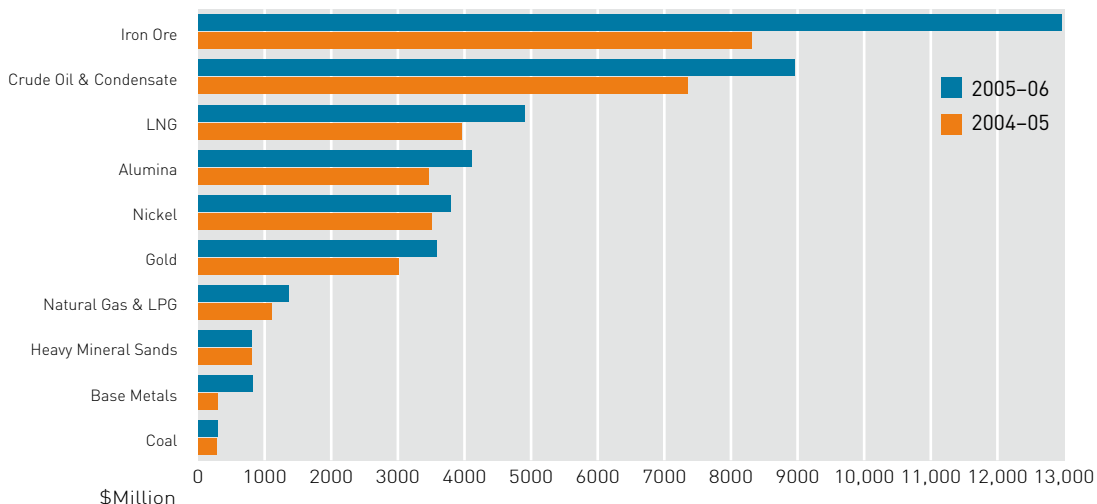


Figure 5 | Major Commodities by Value Source: DoIR

2. MINERALS AND PETROLEUM INDUSTRY 2005-06 REVIEW

RESERVE BANK OF AUSTRALIA (RBA) COMMODITY PRICE INDEX

The Reserve Bank of Australia Commodity Price Index is based on the price of 19 major commodities exported by Australia. These commodities collectively account for around two-thirds of total commodity exports. The index is apportioned into three sections – rural, non-rural and base metals.

The non-rural index comprises base metals (which consist of aluminium, copper, nickel, zinc and lead), gold, coking coal, steaming coal, iron ore, alumina and LNG. The index is compiled monthly and is expressed in US dollars, Australian dollars and Special Drawing Rights (SDR).

The RBA's index, expressed in US dollar terms is useful because most commodities are traded in world markets in US dollars. However such an index is subject to changes in the US dollar exchange rate (as it is based on spot prices). In this respect, the SDR index is a better indication of underlying supply and demand for commodities than the US dollar index.

SDR is a unit of account used by the International Monetary Fund (IMF). Its value is based on a basket of currencies comprising the euro, Japanese yen, English pound and US dollar. Weights are assigned to each of these currencies to reflect their relative importance in world terms. The RBA expresses the SDR component of its index in US dollar terms, with commodity prices derived from the London Metal Exchange and Bloomberg and converted to monthly averages of daily data.

Alternatively, the Australian dollar index is useful for gauging the domestic currency price received by Australian commodity exporters as it reflects the interrelation between world commodity prices and the Australian exchange rate. For example, if prices in foreign currency terms remain unchanged but the Australian dollar depreciates, this will be recorded as a favourable upward shift in the index, which would not be evident in either the SDR or US dollar index.

The RBA index is a fixed-weight Laspeyres index, using 2001-02 as the base year and excludes crude oil. The index is re-based every five years in order to make long-run reliable comparisons, unlike the national accounts that are re-based annually to track short-run movements. Base-period weights indicate the relative importance given to individual commodities. They are based on gross exports thus explaining the omission of crude oil (for which Australia is a net importer) and correspond to the export value of each commodity as a share of total exports. These weights change over time to reflect changes in the composition of commodity exports. Movements in the index from one period to the next reflect underlying price movements and do not take into account changes in volumes.

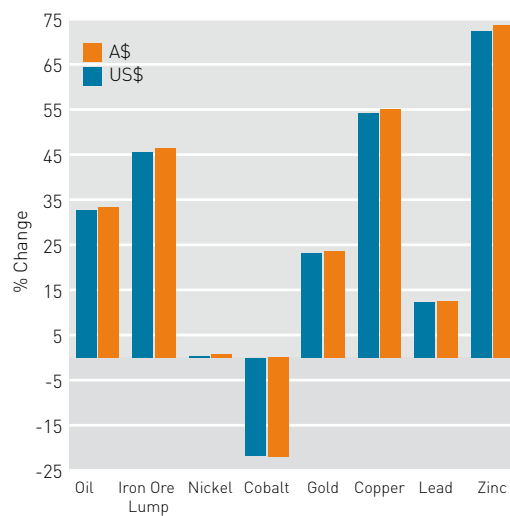


Figure 6 | **Average Price Comparison
2004-05 and 2005-06**

Source: LME, Kitco, TEX Report, Metal Prices

GLOBAL ECONOMIC CONTEXT

With Western Australia's resources sector's performance strongly dependent on global economic growth, a positive outlook on the world economy should bolster the sector's continued good performance. While risks to this outlook are present, the most likely adverse event for the global economy would appear to be an economic slowdown in the US that ends in recession.

A favourable short-term world economic outlook was confirmed in September 2006 with the International Monetary Fund (IMF) raising its forecasts for 2007 and expecting growth to broaden with projections for Germany, France, Italy, Spain and the UK upgraded. The growth forecast for the US was 2.9 per cent and the broadening growth base among mature economies together with continued growth in the US is particularly reassuring for emerging markets.

The favourable outlook, however, also depends on whether inflationary pressures are successfully contained with only modest increases in official interest rates. An increased inflation risk, among other factors, means that there is a greater possibility that global growth may falter and the IMF reported a one in six chance that global economic growth could be 3.25 per cent or less in 2007.

Focusing on the United States, the world's largest economy which accounted for 20 per cent of the world's total output in 2005, the IMF forecasts that it is likely to continue to decelerate modestly. The latest data shows that the US economy grew at an annualised growth rate of 2.5 per cent in the June quarter 2006, compared with 5.6 per cent in the March quarter.

China of course continues to grow at exceptionally high rates. According to China's National Bureau of Statistics, it expanded by 11 per cent in the year to June quarter 2006, following a 10 per cent rise in the year to March quarter 2006. After years of consistently high economic growth, China accounted for 15 per cent of the world's total output in 2005. In contrast to the US economy, the Chinese economy is driven mainly by exports and investment.

Japan recorded an annual growth rate of 1.0 per cent in the June quarter 2006, down from a year-on-year rise of 2.7 per cent in the previous quarter. Private non-residential investment was the main driver of economic activity, followed by private demand and exports of goods and services. Turning to India, although the June quarter official estimate for India's GDP is yet to be released until late September, a number of crucial indicators such as industrial production and passenger car sales already suggest stronger than expected growth.

In Europe, in nominal terms, Germany appeared to expand by 2.4 per cent in the year to June quarter 2006. The growth was due largely to a recovery in business investment in plant and equipment, and construction. The French economy also continued to grow in the June quarter, recording an annual growth rate of 2.6 per cent. Exports and capital investment were the main drivers of economic activity. Likewise, the UK continued its expansion, with growth up by 0.8 per cent in the second quarter of 2006, following a 0.7 per cent rise in the first quarter. The main drivers in the economy were activity in the service sector and spending by households and government.

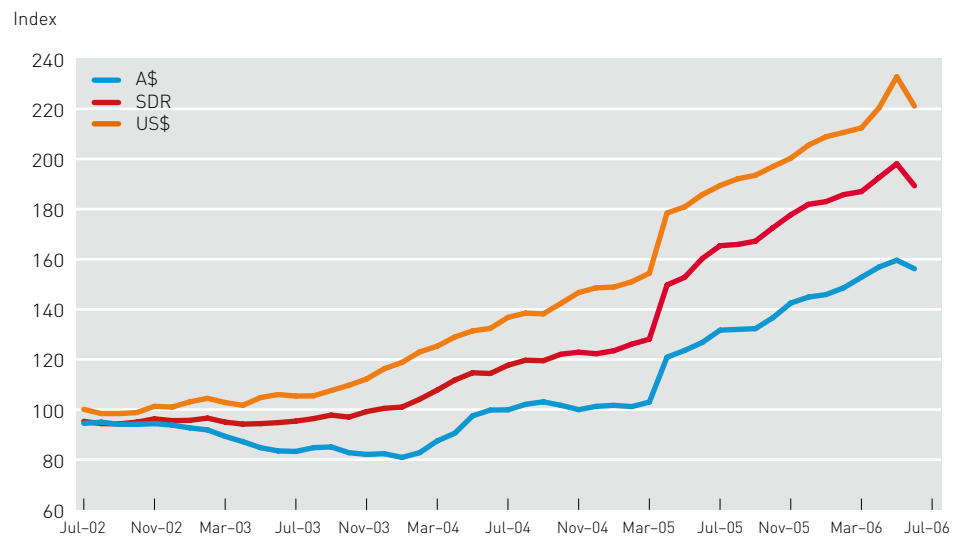


Figure 7 | **Non-Rural Commodity Price Index 2001-02 = 100**
Source: Reserve Bank of Australia

Tenements in Force 1978 Act

	1999-00		2000-01		2001-02		2002-03		2003-04		2004-05		2005-06	
	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha
Prospecting Licences	5,827	745	5,512	711	4,964	635	4,566	575	4,561	568	4,665	586	5,056	638
Exploration Licences	3,394	20,687	3,162	18,152	2,899	18,556	2,855	21,123	2,917	20,896	3,066	22,215	3,966	30,822
Mining Leases	4,865	1,829	4,841	1,803	4,820	1,774	4,770	1,762	4,713	1,716	5,172	1,805	5,118	1,806
Other	2,001	468	3,625	2,840	3,618	3,002	3,629	3,299	3,590	3,115	3,258	2,982	3,432	3,037
Mineral Claims & Other 1904 Act	194	22	186	21	186	22	186	22	186	22	186	22	186	21
Total	16,280	23,751	17,326	23,829	16,487	23,988	16,006	26,781	15,967	26,317	16,347	27,610	17,758	36,324

Source: DoIR

2. MINERALS AND PETROLEUM INDUSTRY 2005-06 REVIEW

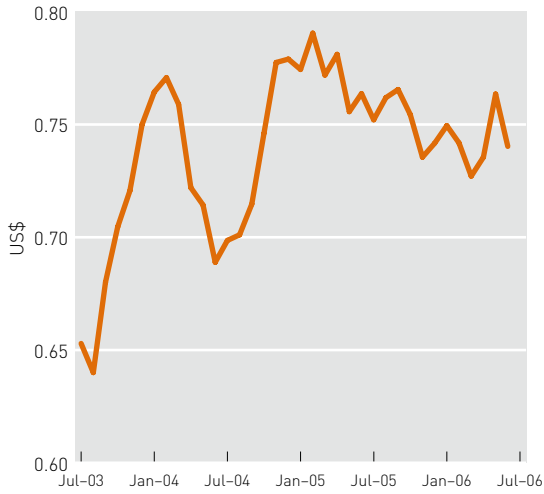


Figure 8 **Exchange Rate US\$/A\$**
Source: Reserve Bank of Australia

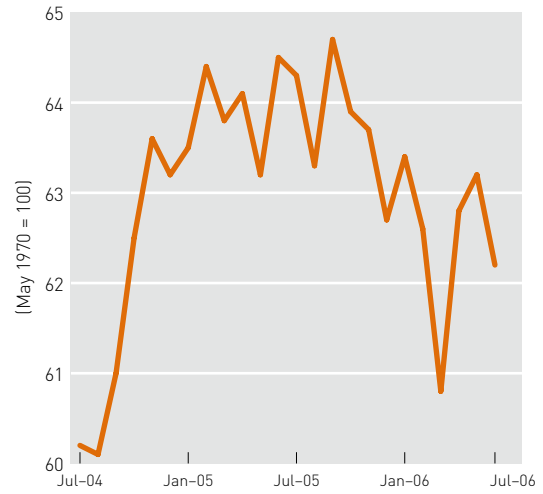


Figure 9 **Exchange Rate Trade Weighted Index**
(units of foreign currency per A\$)
Source: Reserve Bank of Australia

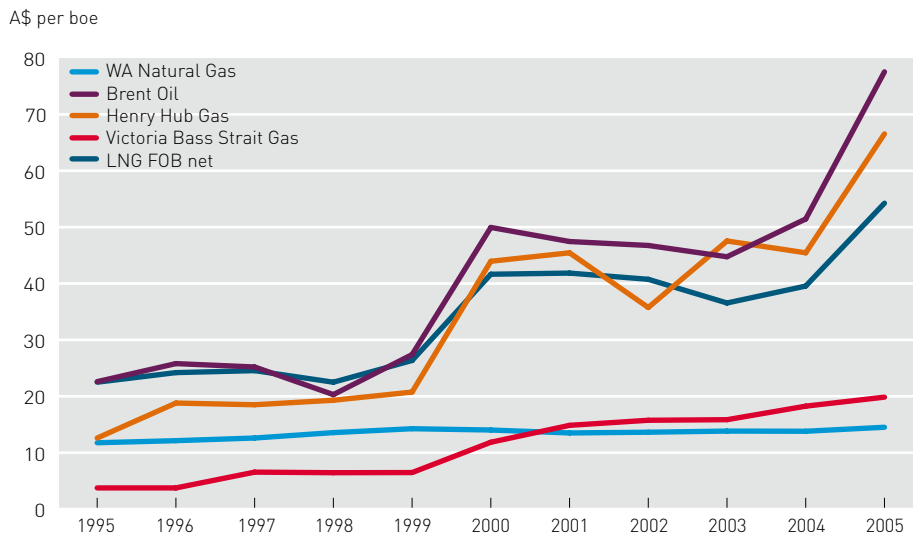


Figure 10 | **Average Product Price** Source: Wood Mackenzie and DoIR

2.2 Petroleum

OIL, GAS AND CONDENSATE

Petroleum is the largest resource sector by value and a sales increase during 2005–06 of 23 per cent (or \$2.8 billion) saw it reach a record total level of \$15.2 billion, chiefly due to high world oil prices together with increased LNG shipments. The Western Australian petroleum industry also holds an eminent position nationally, accounting for 67 per cent of national oil, gas and condensate output during 2005–06.

During the course of 2005–06, the price of oil based on a combination of Brent, WTI and Tapis, averaged US\$64.43 per barrel. This represented a 34 per cent increase compared to the equivalent average price in 2004–05 and notably, in May 2006, the Tapis oil price peaked at US\$78.79 per barrel. The average devaluation of the Australian dollar relative to its US counterpart during 2005–06 was only half a percentage point. Therefore, similar to the outcome in US\$ terms, in Australian dollar terms, the average price of oil based on a combination of Brent, WTI and Tapis represented a 35 per cent increase compared to the equivalent average price in 2004–05.

The strong oil prices resulted in a 20 per cent increase in the value of crude oil sales to realise \$6.2 billion worth of sales and make crude oil the most valuable Western Australian petroleum resource in terms of sales. It needs to be emphasised however, that this outcome was driven by the significant increase in oil prices which masked decreased physical output.

Due to decreased production from several mature oil fields, the actual volume of crude oil sales dropped by ten per cent during 2005–06 to 73 million barrels (200 000 barrels per day). Focusing on the 17 fields which exhibited production drops, their total fall in oil sales amounted to 24 million barrels. Production decreases were most notable in the Harriet, Griffin, Woollybutt, Legendre and Wanaea fields which alone accounted for almost 20 million barrels of decreased oil output.

The total net fall in output was ameliorated by an increase in output of 16 million barrels from eight oil fields. The chief contributor accounting for more than 80 per cent of this increase was Santos' new Mutineer–Exeter field in the offshore Carnarvon Basin which commenced production in March 2005.

The value of condensate sales in 2005–06 was \$2.8 billion, representing a 27 per cent increase compared to the previous financial year. However, this masked a static volume of physical condensate sales. The quantity of condensate sold in 2005–06 totalled 35 million barrels and was almost identical to the volume sold in 2004–05.

Volume of condensate sales remained unchanged in 2005–06 at 35.4 million barrels (97 000 barrels per day). This was primarily due to declining recovery from the Echo–Yodel field combined with conclusion of production from Apache's East Spar field being offset by the commencement of production from Apache's new John Brookes field and resumption of higher output from Goodwyn.

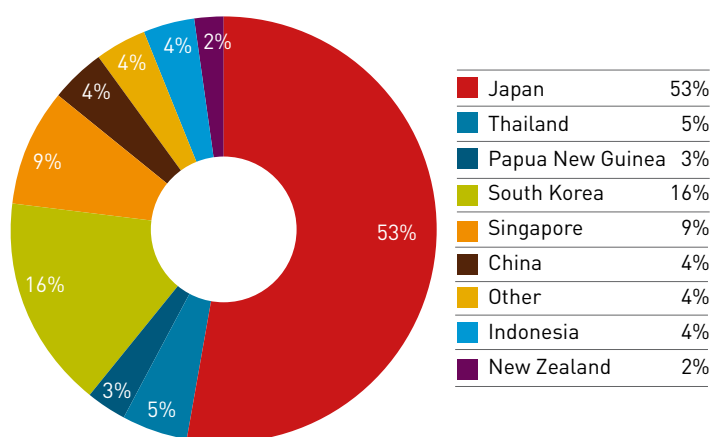


Figure 11 | **Petroleum Exports**
Total Value \$10.9 billion Source: DoIR and ABS

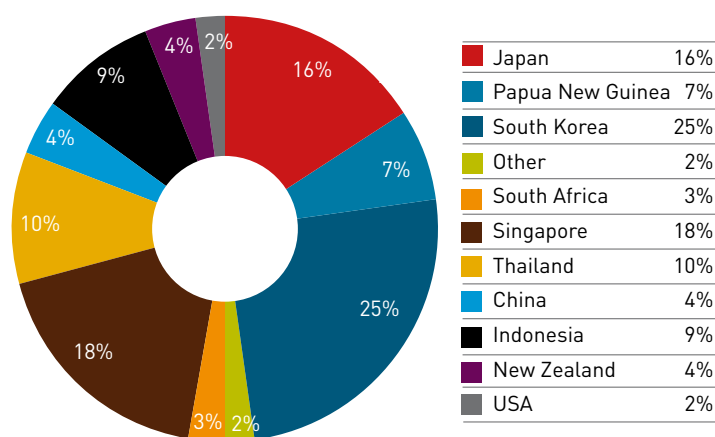


Figure 12 | **Crude Oil and Condensate Exports**
Total Value \$5.3 billion Source: ABS

2. MINERALS AND PETROLEUM INDUSTRY 2005-06 REVIEW

LPG butane and propane enjoyed a healthy output increase of 12 per cent, returning a sales value of \$654 million, up 55 per cent in 2005-06. Natural gas sales remained relatively steady with a small increase in quantity sold of nearly one per cent and an increase of four per cent in value to reach \$703 million. The value of natural gas sales reported in the Digest is based on the sales value of gas delivered into the Dampier to Bunbury Natural Gas Pipeline (DBNGP) in Karratha.

Of particular relevance to future volume of gas sold domestically in Western Australia was the announcement in September 2006 of the Stage 5A \$700-million expansion of the DBNGP. This is Western Australia's most critical energy infrastructure asset and the expansion will comprise laying additional pipe alongside the existing pipeline in a process known as looping. Stage 5A will consist of ten loops, totalling in excess of 570 kilometres and will mean that about half of the DBNGP will have been duplicated.

Construction of the latest expansion is expected to begin in early 2007 with the first capacity to be commissioned during the first quarter of 2008 and the balance by the third quarter of 2008. Expansion of the pipeline will allow an increase in gas transmission capacity of around 100 terajoules per day (as at the end of the Stage 4 expansion, total capacity was around 720 terajoules per day). As with the previous Stage 4 expansion, all additional capacity will be fully contracted to new and existing shippers under long-term arrangements.

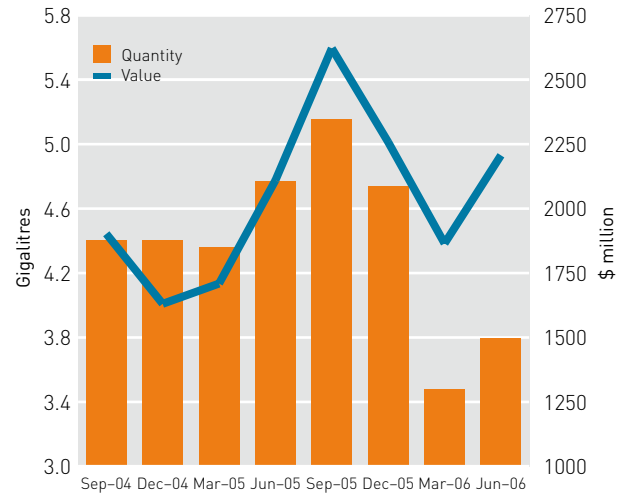


Figure 13 | **Crude Oil and Condensate Quantity and Value by Quarter**
Source: DoIR

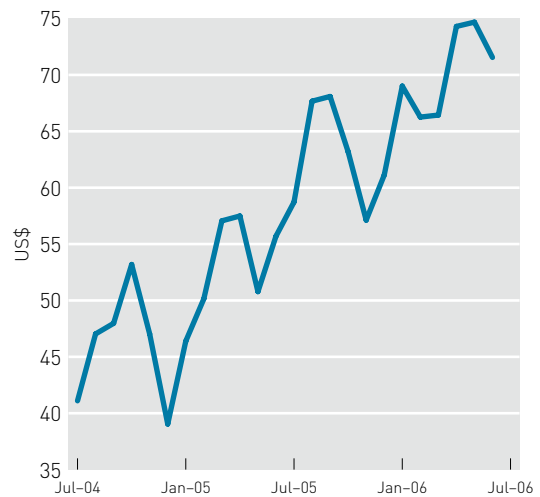


Figure 14 | **Tapis Crude Oil Price US\$/bbl**
Source: WA Treasury Corporation

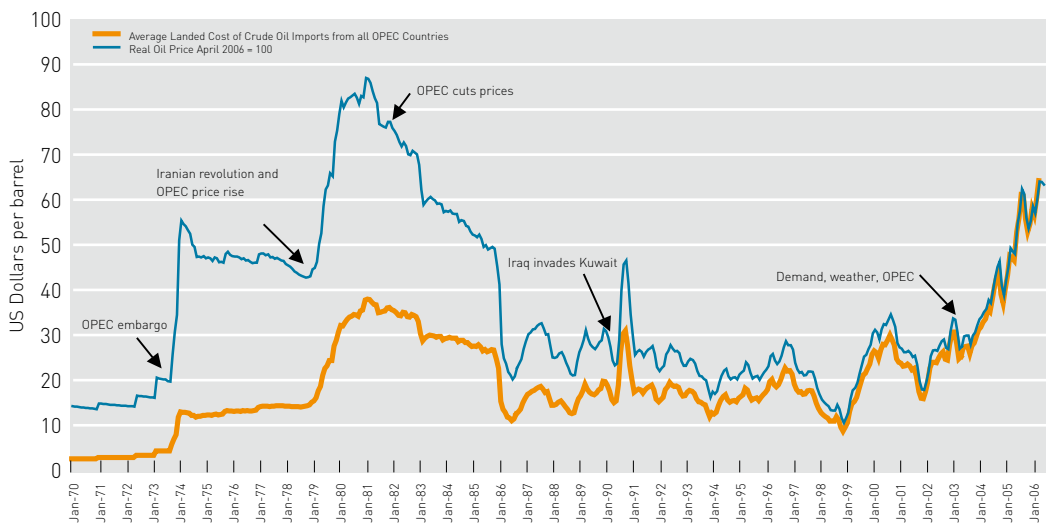


Figure 15 | **Historic Oil Prices** Source: Energy Information Administration, US Department of Energy; DoIR

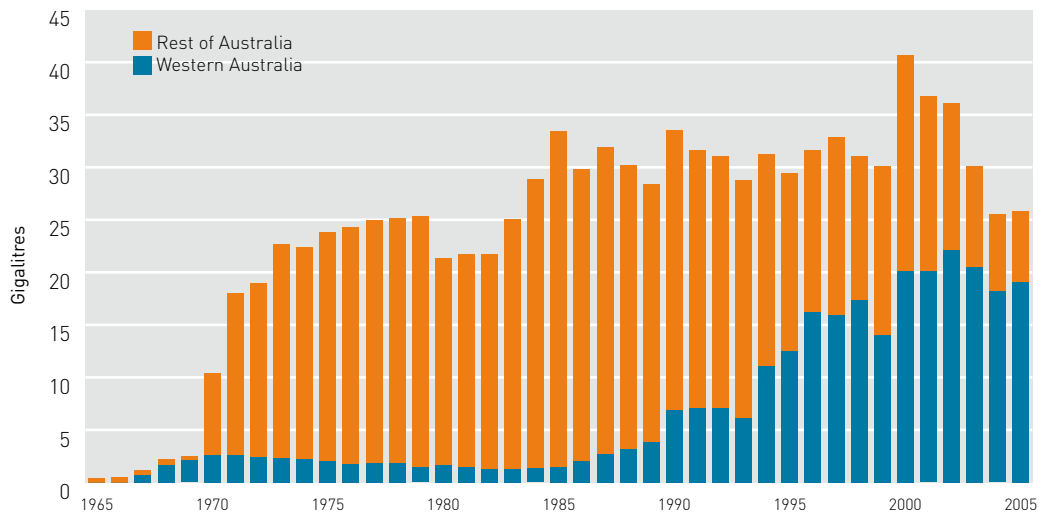
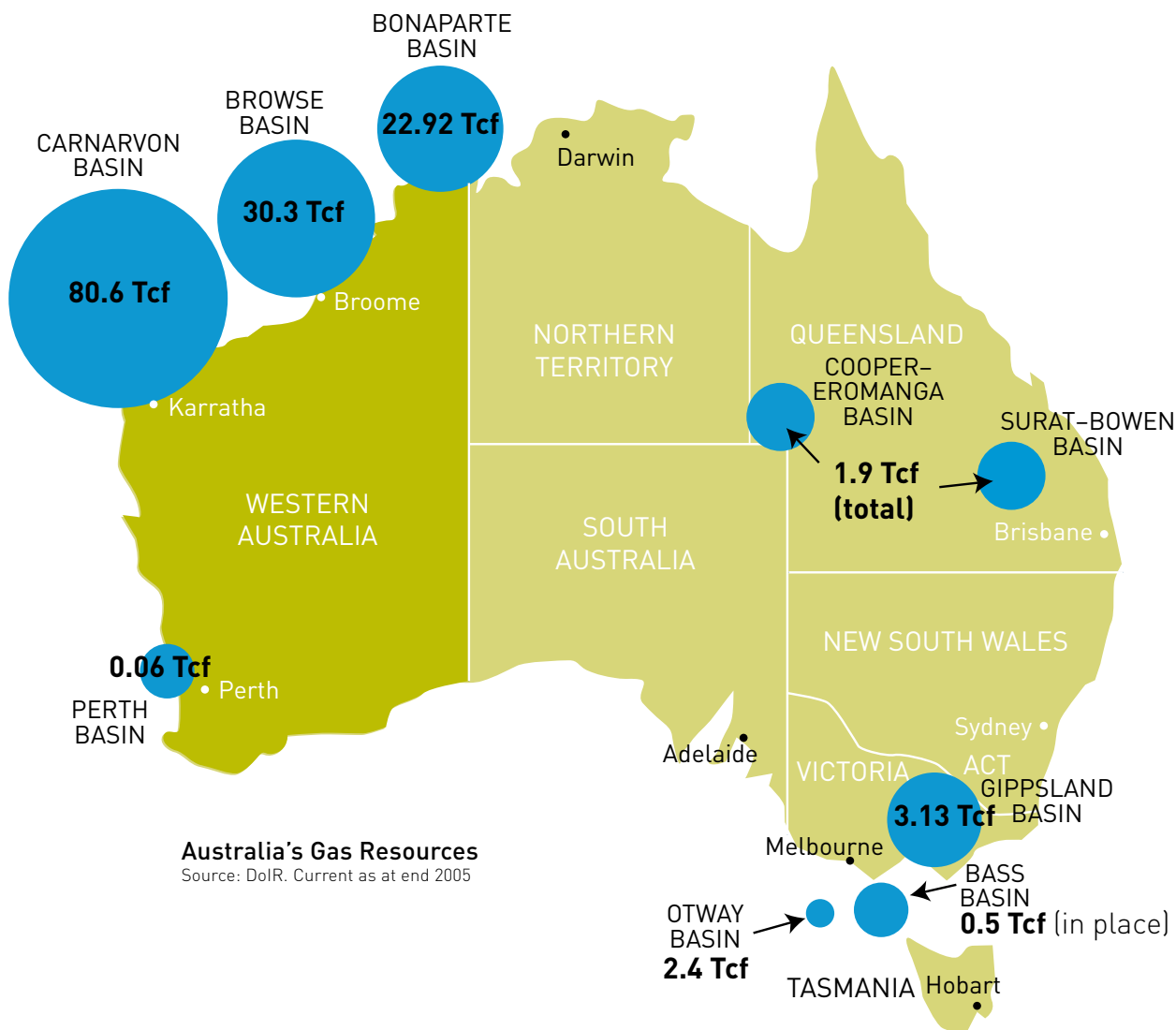


Figure 16 | **Crude Oil and Condensate Quantity** Source: DoIR and ABARE

2. MINERALS AND PETROLEUM INDUSTRY 2005-06 REVIEW

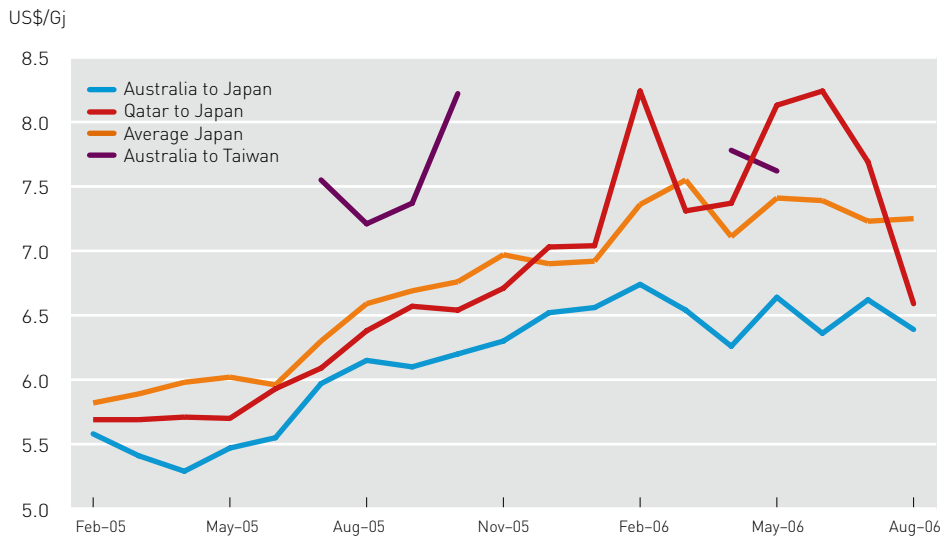


Figure 17 | **LNG Import Prices** Source: Argus Monthly LNG

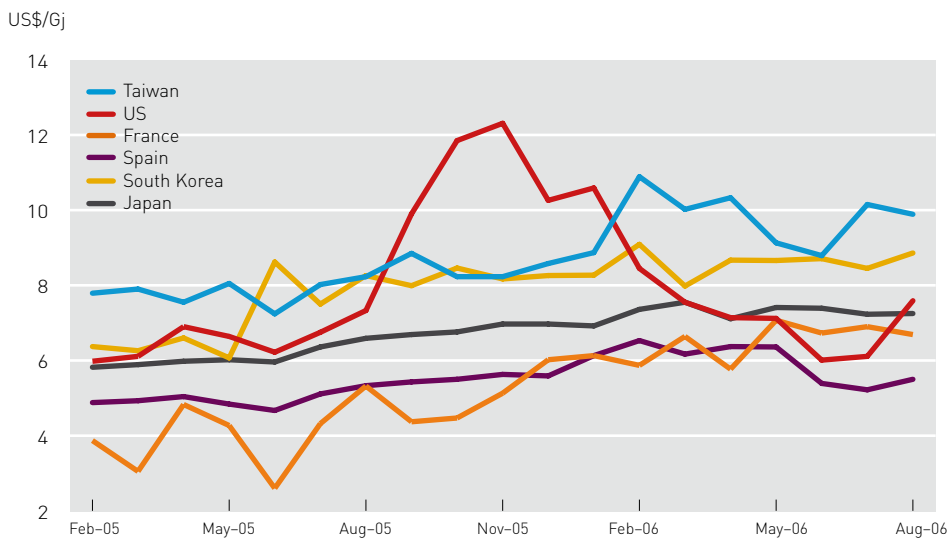


Figure 18 | **Average LNG Import Prices** Source: Argus Monthly LNG

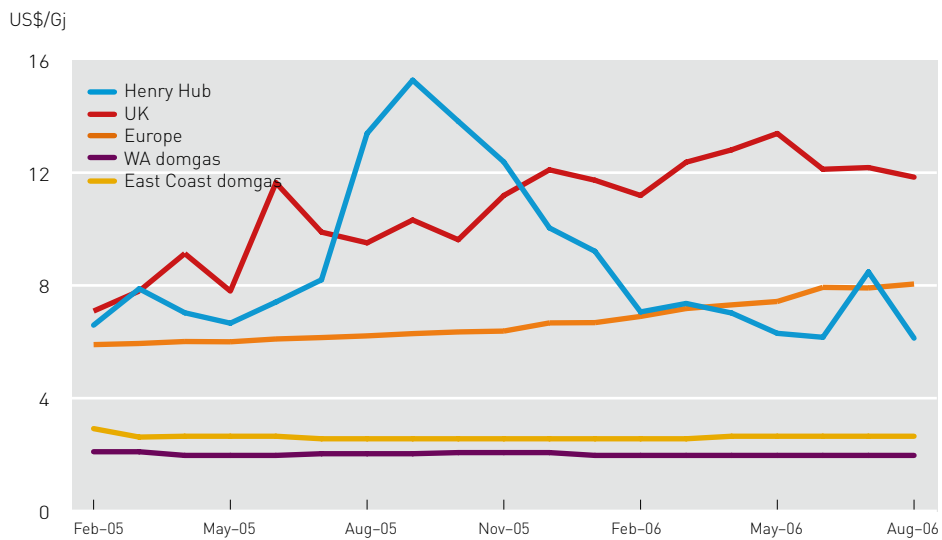


Figure 19 | **Average Natural Gas Prices** Source: Argus Monthly LNG, EnergyQuest, DoIR

LNG

LNG sales volumes rose by six per cent to realise a record sales value of \$4.9 billion, an increase of 24 per cent. This makes LNG the third most valuable individual commodity in the State after iron ore, and crude oil and condensate. Significantly, the NWS LNG project reached a major milestone in January 2006 with the export of its 2000th LNG cargo and 1000th condensate cargo. Also, in May 2006, the NWS LNG project shipped the first LNG cargo to China's first LNG receival terminal at Guangdong in southern China.

The LNG quantity published in the Digest is sourced from Woodside's quarterly Australian Stock Exchange reports. A value is obtained by multiplying this quarterly figure by an LNG price. This price is an average published import price for a given quarter, converted at the average exchange rate for that quarter.

All LNG from Western Australia emanates from the NWS joint venture project in Karratha which comprises four LNG production unit trains. Commissioned in August 2004, the 4.2-million-tonnes-per-annum fourth train is Australia's largest single LNG production unit.

Train 4 boosted NWS production to almost 12 million tonnes a year and its design is being replicated in Train 5, now under construction on the Burrup Peninsula. When completed in 2008, it will lift the project's capacity to about 16.3 million tonnes a year and make it one of the biggest LNG plants in the world. However, Western Australia is no longer the nation's sole LNG producer with ConocoPhillips and its partners commissioning the 3.5-million-tonnes-per annum Darwin LNG plant earlier in 2006. It is possible Darwin LNG could see the construction of a second production train by 2013 using gas from the Greater Sunrise fields or the Caldita discovery in conjunction with other as yet undiscovered fields in the Timor Sea and Bonaparte Basin.

Whilst Darwin LNG has become Australia's second LNG hub, after the NWS, indicators point to it not being the last. Woodside, operator of the NWS LNG project, discovered the Pluto gas field in April 2005, located approximately 180 kilometres from the Burrup Peninsula and is planning to

develop an LNG project using gas from this 3.5-trillion-cubic-foot field. The LNG facility itself is to be based on the Burrup Peninsula and produce five to seven million tonne of LNG per annum.

Woodside is also appraising its extensive gas reserves in the Browse Basin, off Western Australia's Kimberley coast which have the potential for a major gas production hub. The Browse Basin area gas includes the Torosa (formerly known as Scott Reef), Brecknock and Calliance (formerly known as Brecknock South) discoveries. Combined, these fields hold an estimated resource exceeding 20 trillion cubic feet of gas and 300 million barrels of condensate. Options for an LNG development to process gas from these fields cover both an offshore and onshore processing plant. Potentially, the first cargo from Browse could be delivered from 2012–2014 subject to additional appraisal and customer negotiations. This would require a final investment decision to be made around 2008–2010.

Chevron is also considering an LNG and domestic gas development of up to ten million tonnes per annum based on Barrow Island, sourcing gas from its Gorgon and Jansz fields. Other additional potential LNG projects include Inpex's Browse Basin – Ichthys LNG operation and BHP Billiton's – Exxon Mobil's Pilbara LNG project to be based on the Scarborough field.

Western Australia potentially, could therefore have several LNG projects operating within the next decade, depending on market conditions and progress on finalising the developments. In a global context, this potential future number of LNG projects in Western Australia is not unusual when considering various forecast growth rates for the LNG industry as a whole which range from seven to ten per cent annual growth in LNG production.

The boom in LNG developments on drawing boards reflects soaring demand around the world and Western Australia is very well placed to serve East Asian markets, as well as the east coast of India and the west coast of the US. The US, for example, is making rapid progress in accommodating LNG with 12 new terminals being considered, including five in California, although terminals actually located in California are facing tough community opposition.

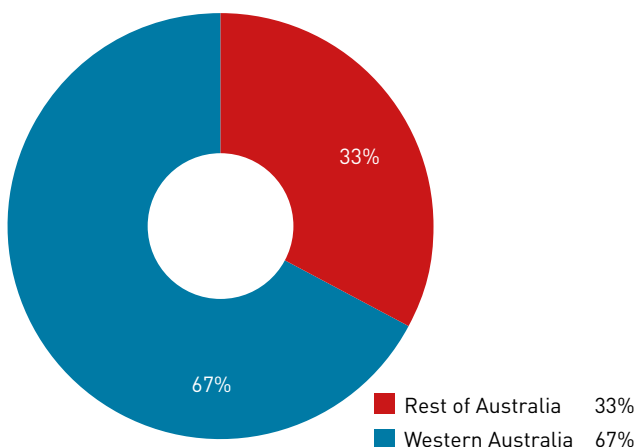


Figure 20 | **Crude Oil and Condensate Production 2005–06**
Source: ABARE

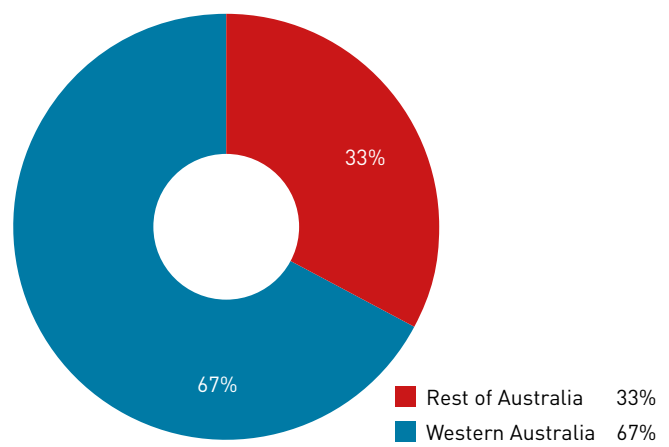


Figure 21 | **Natural Gas Production 2005–06**
Source: ABARE (Data included LNG feedstock)

2. MINERALS AND PETROLEUM INDUSTRY 2005-06 REVIEW

2.3 Iron ore

In 2005-06, the iron ore industry broke new records in terms of output, despite the effect of the severe cyclone season experienced in the March quarter of 2006 and continued operational bottlenecks.

The State's iron ore industry plays a pivotal role in Western Australia's export-driven economy, with the industry contributing \$12.96 billion or 30 per cent of the total value of mineral and petroleum sales for 2005-06. This equates to around \$1.5 million per hour and accounts for 27 per cent of the State's merchandise exports. Supported by Chinese demand, iron ore sales reached record volumes for a seventh consecutive year, increasing by four per cent to 244 million tonnes.

China dominates Western Australia's iron ore exports, accounting for over half (53 per cent) of the total amount shipped for 2005-06. The past five years have seen China's appetite grow three-fold whilst Japan has grown only 19 per cent over the same period. Japan received 29 per cent of the State's exports for 2005-06. Other markets were South Korea, Taiwan and Europe.

All of the State's iron ore producers made a significant contribution to this impressive performance. The success of the State's iron ore industry rests critically on reliability, competitiveness and quality control in a demanding trading environment. Furthermore, the State's iron ore industry continues to improve its competitiveness in mining practices, technological innovation and management processes. The continued fine-tuning of these sectors will be critical to the success of the industry in the years ahead.

As the largest importer of iron ore, it was expected that China would play an increased role in price negotiations for the current contractual year with the world's big three iron ore producers (Companhia Vale do Rio Doce [CVRD], Rio Tinto and BHP Billiton). Falling steel prices had eroded steel producers' profit margins worldwide, however this fall was driven by a period of de-stocking and steel prices have since recovered as demand remains robust.

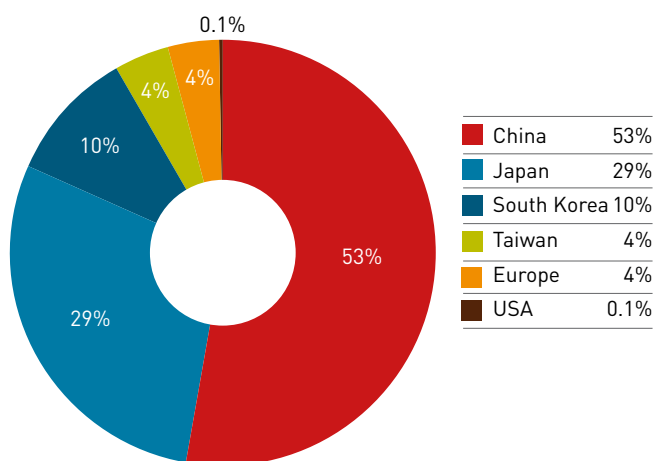


Figure 22 | **Iron Ore Exports**
Total Value \$12.73 billion Source: DoIR

Strong steel demand has led to increased demand for steel-making raw materials and the short- and medium-term outlook for the supply of iron ore has been affected by cyclone activity in Australia, unforeseen interruptions in Brazil and the ongoing global difficulty in sourcing some mining equipment such as speciality tyres and rail wagons.

The world's major suppliers' case for a price increase was based upon high demand and constrained supply coupled with increased steel prices, easing freight rates and lower metallurgical coal costs. In May 2006, European, Japanese, South Korean and Chinese-Taipei steel-makers agreed to a 19 per cent increase in negotiated prices with all three major producers. It was not until 20 June 2006 that Boasteel (China's representative) agreed to a 19 per cent increase in negotiations with BHP Billiton.

Whilst the larger iron ore operations are based in the Pilbara region of Western Australia, there are two mines in the Midwest region, one in the Kimberley region and one in the Yilgarn. Rio Tinto Limited (with its wholly owned subsidiary Hamersley Iron Pty Ltd and its 53 per cent shareholding in Robe River Mining Company Pty Ltd) and BHP Billiton (BHPB) dominate the industry in Western Australia and account for around 90 per cent of the State's iron ore production.

The smaller producers consist of Portman Limited with its Koolyanobbing operation about 50 kilometres northeast of Southern Cross and its smaller operation at Cockatoo Island, around 140 kilometres north of Derby. Mount Gibson Mining Ltd with its Tallering Peak operation, 50 kilometres north-northeast of Mullewa and the most recent new producer, Midwest Corporation Limited with its Koolanooka operation, 160 kilometres east-southeast of Geraldton.

Due to unprecedented strong demand, iron ore companies have been accelerating the development and expansion of their operations. Because of the magnitude of these works, the full impact of some of these projects will not be realised until 2007-08 and beyond. It is also recognised that difficulties in the acquisition of some mining equipment and skilled labour are expected to slow the ongoing expansion of the iron ore industry. Investment in



Figure 23 | **Iron Ore Price A\$/Fe unit**
Source: Tex Report, High Grade Fine Ore Prices

these expansions amounts to around US\$4.7 billion (A\$6.3 billion) with another US\$9.8 billion (A\$13 billion) potential new investment. Some of this work includes:

- BHPB's \$2.4-billion Rapid Growth Projects 2 and 3 which will increase the capacity of its Pilbara iron ore operations to approximately 129 million tonnes per annum. Expansion includes its mine, rail and port facilities as well as the purchase of additional rolling stock and a new car dumper at Finucane Island.
- Rio Tinto's wholly owned Hamersley Iron's \$700-million mine expansion of Yandicoogina to increase production from 36 million tonnes per annum to 52 million tonnes per annum. Once completed, this will make Yandicoogina the largest iron ore mine in the Pilbara. This latest expansion follows their recently expanded operations by establishing a new wet processing plant to process low grade ore, an overland conveyor and tertiary crushing/screening facilities.
- Rio Tinto will invest \$920 million to further expand port facilities at Dampier which will increase its annual shipping capacity from 116 to 140 million tonnes per annum. On completion in 2007, the expansion will take the capacity of Rio Tinto's ports in the Pilbara close to 200 million tonnes per annum.
- Rio Tinto are proceeding with the \$1.5 billion development of the Hope Downs iron ore mine and a 58-kilometre railway line connecting into the Pilbara Iron rail system near West Angelas. The rail link will have the capacity of carrying up to 30 million tonnes per annum of Marra Mamba ore to either Dampier or Cape Lambert for export. First production is expected in 2008. The area is the subject of a 50:50 joint venture agreement between Hancock Prospecting Pty Ltd and Rio Tinto Iron Ore.
- The Port of Geraldton has undergone an upgrade to Birth 5 to include a new iron ore ship loader and modifications to adjacent berthing pockets to allow 240-metre iron ore carriers to call at the port. This \$35-million upgrade includes a dedicated iron ore berth which is critical to meet the increasing demand for iron ore exports from the area.

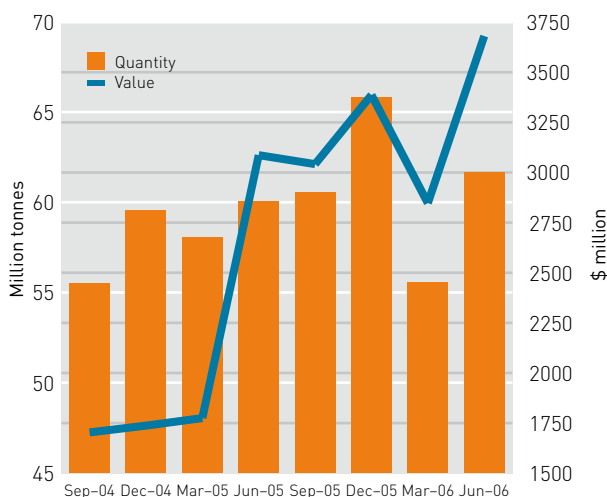


Figure 24 **Iron Ore Quantity and Value by Quarter** Source: DoIR

The next producer to commence operations will be Murchison Metals Ltd which is nearing the commencement of mining of its Jack Hills project in the Midwest region located 380 kilometres northeast of the port of Geraldton. Murchison Metals' high grade hematite ore will be using contract mining, crushing and screening operations and first shipments are scheduled to commence in September/October 2006. Ore will be transported to Geraldton by road to Murchison Metal's new ore storage and transfer facility at the port of Geraldton ready for shipment.

Murchison Metals proposes to develop the Jack Hills project in two stages. Stage 1 will initially produce 1.5 million tonnes per annum commencing in the second half of 2006 increasing to two million tonnes per annum in 2008. Stage 2 involves increasing annual production of direct shipping of high grade ore up to 25 million tonnes per annum. The ore would be railed to a new deep-water port facility at Oakajee, 22 kilometres north of Geraldton.

Oakajee is the Western Australian Government's preferred site for a new privately funded deep-water port to accommodate the rapidly expanding iron ore industry in the Midwest region of the State. In late 2005, the Geraldton Iron Ore Alliance (GIOA) was formed to take a coordinated approach to the common-user infrastructure development and stakeholder relations required to unlock the full potential of Australia's fastest growing new iron ore province. GIOA members consist of:

- Midwest Corporation Ltd;
- Murchison Metals Ltd;
- Gindalbie Metals Limited;
- Mount Gibson Iron Limited; and
- Golden West Resources Limited.

In other developments, Fortescue Metals Group (FMG), a new entrant of the State's iron ore sector, has received State and Federal Government environment approval for their Cloud Break tenement in the Chichester Range. FMG is scheduled to start commissioning its \$2.5-billion project in the first quarter of 2008.

In late 2004, negotiations between the State Government, FMG and The Pilbara Infrastructure (TPI – a subsidiary of FMG) were completed for a State Agreement that will facilitate new \$1.4-billion multi-user railway and port infrastructure in the Pilbara. Under this agreement, TPI proposes to construct a 520-kilometre multi-user railway from iron ore deposits in the eastern and central Pilbara to Port Hedland and to develop new multi-user facilities at the port.

FMG has now secured sales agreements for 39.5 million tonnes per annum, which represents 88 per cent of expected initial production of 45 million tonnes per annum from their Chichester Range tenements.

Gindalbie Metals Ltd is developing the two-stage Karara iron ore project (located 45 kilometres east of Koolanooka) in a joint venture with Anshan Iron and Steel Group Corporation (AnSteel), China's second-largest steel producer.

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The first stage of the project involves mining of direct shipping hematite ore from Karara at an initial rate of 1.5 million tonnes per annum. Logistics involve mining on site, followed by road haulage along the existing 85-kilometre haul-road to Morawa where a rail siding will be built for loading ore onto rail wagons for cartage on the existing Midwest railway network, 200 kilometres to the port of Geraldton. The joint venture is yet to announce a production commencement date.

The second stage involves the mining and concentrating of the 737 million tonnes of magnetite resource at Karara. Some 20 million tonnes per annum of raw magnetite ore will be mined followed by a concentration on site at Karara to produce 8 million tonnes per annum of magnetite concentrate (68.8 per cent Fe). This material will then be transported via a 225-kilometre slurry pipeline to the industrial estate at Narngulu, six kilometres east of Geraldton. The joint venture has also decided to ship concentrate and pellet products to provide maximum certainty for its development and shipment plans.

The forthcoming year will see some operators continue to battle bottlenecks at their northwest iron ore operations, specifically in the rail dumping and ship loading aspects. Whilst expansions and new entrants in the industry try to keep pace with demand, which in the short-to-medium term will be driven by China, globally it may be a race to the market in terms of tonnage. In the longer term, it is forecast that demand will be driven by Brazil, Russia, India and China (BRIC).

Analysts indicate that about 75 per cent of the future growth in the iron ore market will be absorbed by China which by 2008 would represent about 50 per cent of the total seaborne iron ore market. The shortage of supply has created a situation where lower grade, higher cost producers are entering the market.

The State's iron ore industry is poised for a long-term future of high production rates with some initial challenging supply difficulties. It is therefore an industry diversifying into new mines and into a changing product mix with the major iron ore companies continuing to improve product quality and infrastructure.

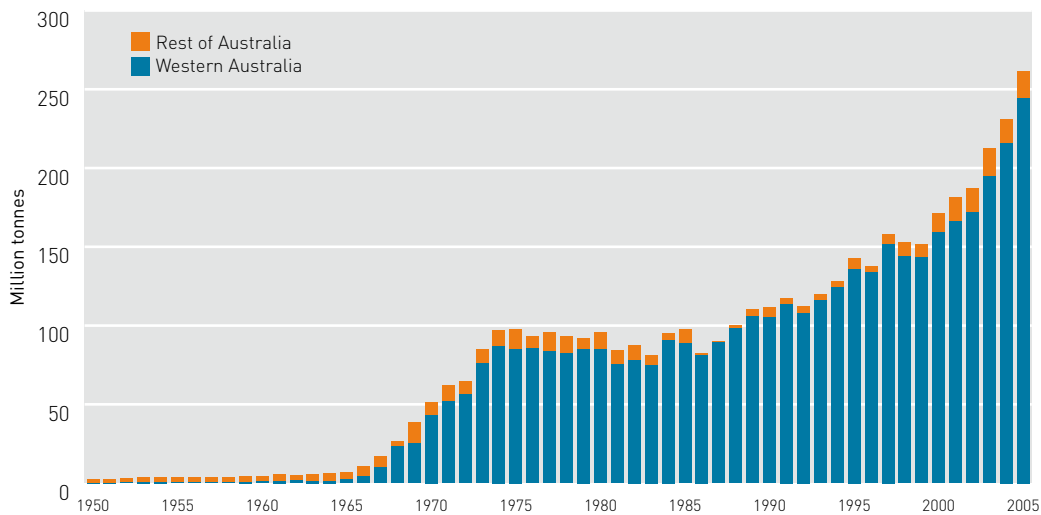


Figure 25 | **Iron Ore Quantity** Source: DoIR and ABARE

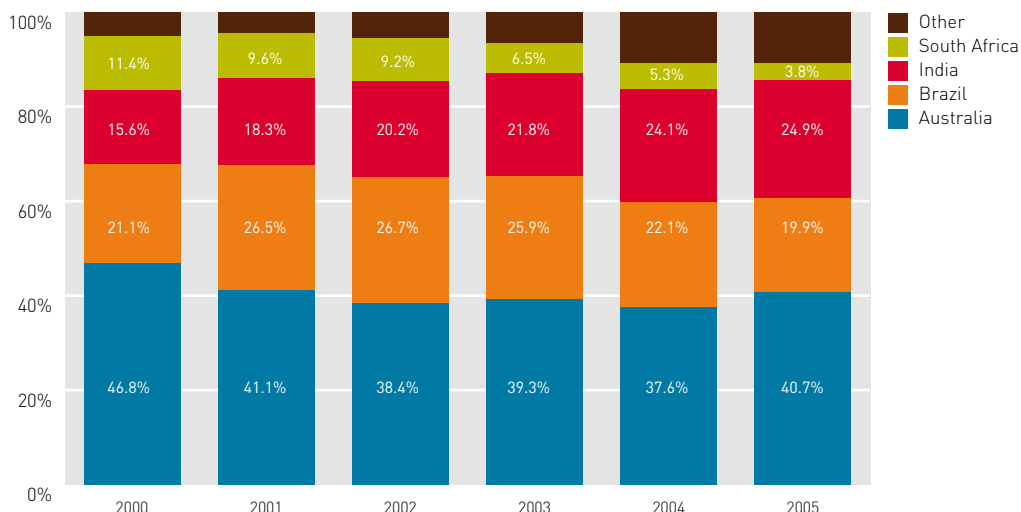


Figure 26 | **China's iron ore imports by source** Source: China Customs and The TEX Report

2.4 Alumina

The State's alumina industry is the third-largest sector in terms of sales after petroleum and iron ore, accounting for ten per cent of total mineral and petroleum sales. During 2005–06, the total quantity of alumina sold continued to break new production records with the quantity sold increasing by three per cent to 11.5 million tonnes in 2005–06, compared to 11.2 million tonnes in 2004–05.

Sale values increased by 19 per cent (\$650 million) to \$4111 million compared with 2004–05. The average annual alumina price (in Australian dollar terms) increased 16 per cent from \$310 per tonne in 2004–05 to \$365 per tonne in 2005–06. In 2005–06, alumina prices continued their upward trend with strong growth from December to the end of the financial year. The year commenced with July alumina prices averaging \$334 per tonne and by June 2006, having increased to \$428 per tonne. In terms of aluminium, in 2005–06 prices averaged US\$2537 per tonne which was only three per cent lower than the record peak in 1988 when tight supply and demand conditions pushed prices to an average of US\$2607 per tonne.

Australia is the world's largest bauxite and alumina producer. In 2005, Western Australia produced 32 per cent and 64 per cent of the world's and Australia's alumina respectively. The State's total alumina production has demonstrated a modest average annual growth rate of four per cent per annum during the past ten years.

The total value of alumina exports in 2005–06 increased by around 22 per cent to \$3.7 billion. Western Australia's markets for its alumina are very diverse with China and South Africa each accounting for 17 per cent (\$663.2 million and \$634.6 million respectively) in 2005–06. This was followed by Bahrain at 15 per cent, the United Arab Emirates accounting for 13 per cent, Mozambique 11 per cent, Canada ten per cent, the United States seven per cent and others making up the ten per cent balance.

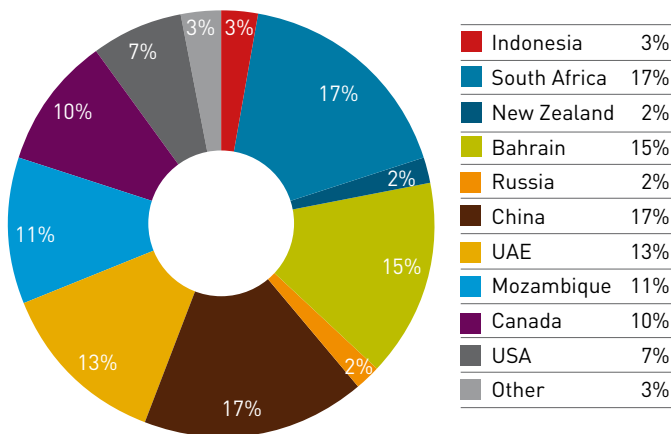


Figure 27 | **Alumina Exports**
Total Value \$3.75 billion Source: DoIR

Alumina exports reflect global aluminium market conditions with around 98 per cent of the world's alumina being used for aluminium production. Alumina feedstock is the largest single component of the cash cost of producing primary aluminium metal. Some two tonnes of alumina are required to produce one tonne of aluminium and the industry is very competitive, with the world's major aluminium-producing companies also playing key roles in both bauxite mining and alumina refining.

Western Australia currently has two alumina producers, Alcoa World Alumina Australia and Worsley Alumina Pty Ltd (BHP Billiton Limited 86 per cent and Japan Alumina Association (Australia) Pty Ltd 14 per cent). Both producers' refineries are located within close proximity to their bauxite mines and shipping facilities which allows economical processing of relatively low-grade bauxite.

Alcoa mines bauxite at their Huntly (the biggest bauxite mine in the world) and Willowdale mines south of Perth and extracts alumina at the Kwinana, Pinjarra and Wagerup refineries.

Worsley's bauxite mine is located approximately 120 kilometres southeast of Perth at Boddington and the crushed ore is transported to the refinery via overland conveyor to Worsley near Collie. Alumina is then carted by rail and exported through the Port of Bunbury.

The 657 000-tonne Pinjarra refinery capacity upgrade to 4.2 million tonnes per annum was commissioned in the last quarter of 2005–06 at a cost of US\$510 million. With the ramp-up of production to continue through to the end of 2006, this will increase overall output for the coming period.

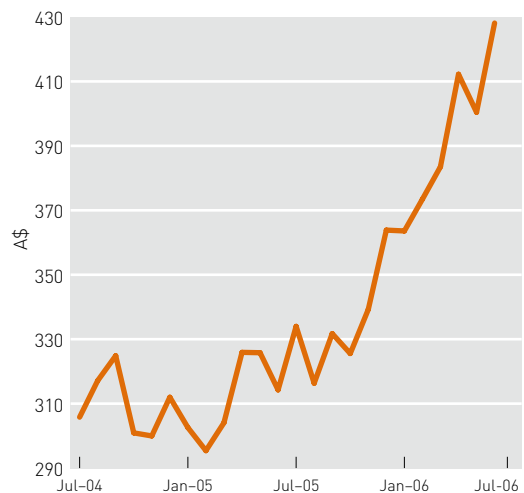


Figure 28 | **Alumina Price A\$/tonne** Source: ABS

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In September 2006, Government approval was given for the construction of a third production unit at the Wagerup refinery to increase alumina capacity from 2.6 million tonnes per annum to 4.7. It is estimated that the project will cost in the vicinity of \$1.5 billion. Approval for the project's expansion is subject to 42 conditions, including that Alcoa funds air quality testing and health surveys in addition to purchasing land. The project is expected to create 1500 jobs during construction and 260 permanent jobs.

The outlook for aluminium is that the market will remain in deficit through 2006. Aluminium demand continues to be strong worldwide and Chinese aluminium consumption continues to be the driver of global demand. Alumina markets are moving to a relatively balanced position, with low inventory levels worldwide and new refinery capacity in China adding significantly to alumina production growth in 2006, reducing Chinese dependence on alumina imports.

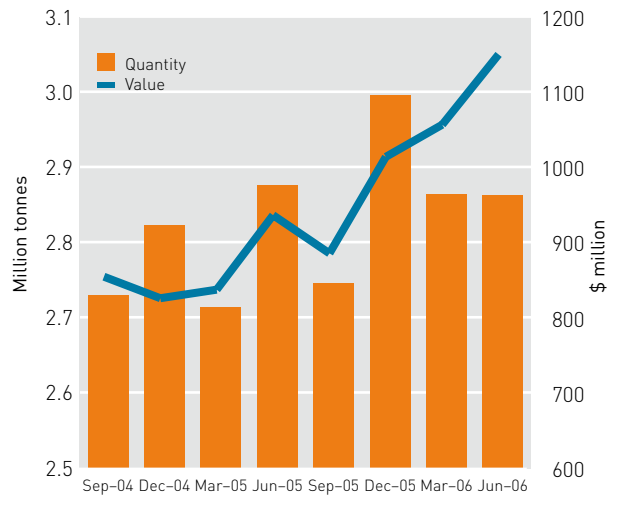


Figure 29 | **Alumina Quantity and Value by Quarter** Source: DoIR

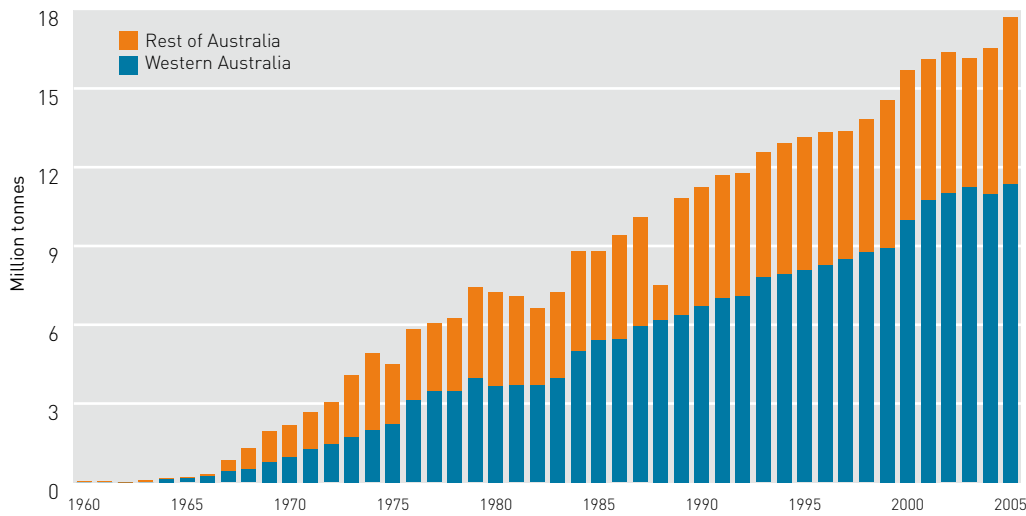


Figure 30 | **Alumina Quantity** Source: DoIR and ABARE

2.5 Nickel

The value of nickel sales reached \$3.79 billion in 2005–06, an increase of eight per cent compared to 2004–05. Sale volumes rose by six per cent to 191 161 tonnes in the same period. Overall average prices received by exporters increased by only four per cent in Australian dollar terms from the previous period.

Stainless steel production accounts for about 65 per cent of world nickel use, which makes the nickel industry highly dependent on developments in world stainless steel markets. Stainless steel production fell in the second half of 2005 as steel producers reduced stocks. This reduction led nickel prices to decline from an average of US\$14 581 per tonne (US\$6.61 per pound) in July 2005 to US\$12 116 per tonne (US\$5.50 per pound) in November 2005. Stainless steel production started to recover in December 2005 and by July 2006 saw the average price reach US\$20 755 per tonne (US\$9.41 per pound). Prices have since surged to record highs and reached US\$33 995 per tonne (US\$15.42 per pound) in late August 2006.

Western Australia remains Australia's only nickel-mining state. The Western Australian nickel industry remains heavily concentrated with the top five producers accounting for 85 per cent of all nickel sales. The largest of these is BHP Billiton's Nickel West with concentrators at Mount Keith, Leinster and Kambalda, the Kalgoorlie smelter and the Kwinana refinery. Nickel West is the world's third-largest producer of nickel in concentrate.

The Murrin Murrin Joint Venture (Minarra Resources Ltd 60 per cent and Glenmurrin Pty Limited 40 per cent) is the second-largest producer with their laterite project located between Leonora and Laverton in the northeast goldfields of Western Australia.

The third-largest producer is LionOre Australia (Nickel) Ltd with its Black Swan operations located 53 kilometres northeast of Kalgoorlie and its Lake Johnston operations (incorporating the Emily Ann and Maggie Hays underground mines) located 125 kilometres southeast of Marvel Loch.

Other major producers include Mincor Resources' Miitel nickel operation (which recorded above its targeted 13 000 tonne of nickel-in-concentrate production for the 2005–06 year) located 13 kilometres southeast of Widgiemooltha and Jubilee Mines NL with their Cosmos operations located 450 kilometres north of Kalgoorlie.

A range of nickel sulphide producers have toll treatment and concentrate purchase agreements in place with Nickel West, trucking ore to be concentrated at their Kambalda concentrator. These operations include:

- Australian Mines Limited's Blair nickel operation;
- Independence Group's Long mine;
- Reliance Mining Limited's Beta Hunt deposit;
- Tectonic Resources NL's RAV8 mine at Ravensthorpe;
- View Resources' Carnilya Hill mine near Kambalda;
- Mincor Resources' Miitel-Wannaway project; and
- Sally Malay Mining Limited's Lanfranchi Tramways operation.

While current Western Australian production is chiefly based on nickel sulphide deposits, most of Western Australia's nickel resources are laterite. However, operational problems in laterite processing have hindered development of these resources.

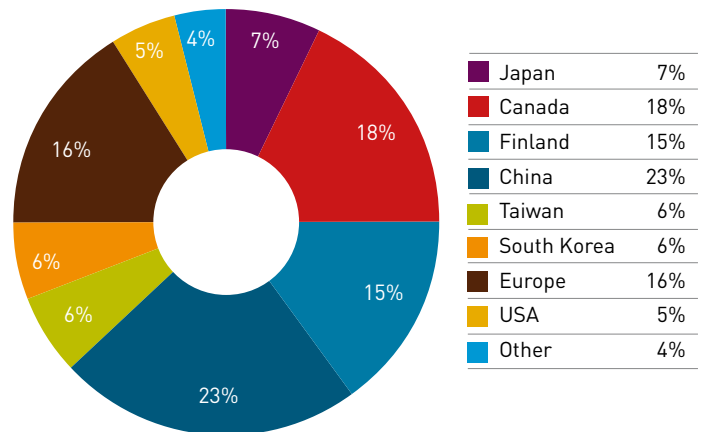


Figure 31 | **Nickel Exports**
Total Value \$2.96 billion Source: DoIR

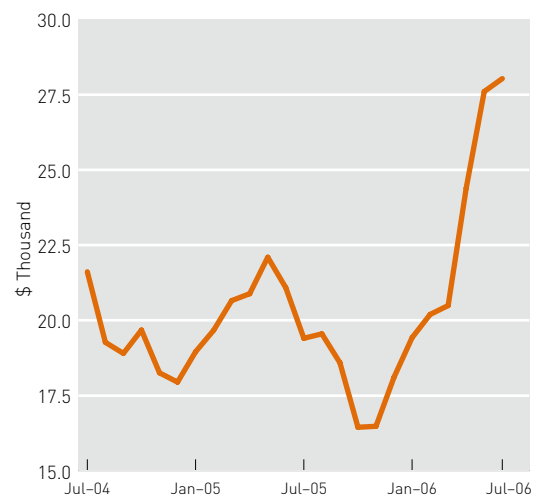


Figure 32 | **Nickel Price A\$/tonne**
Source: LME Cash, Monthly Average

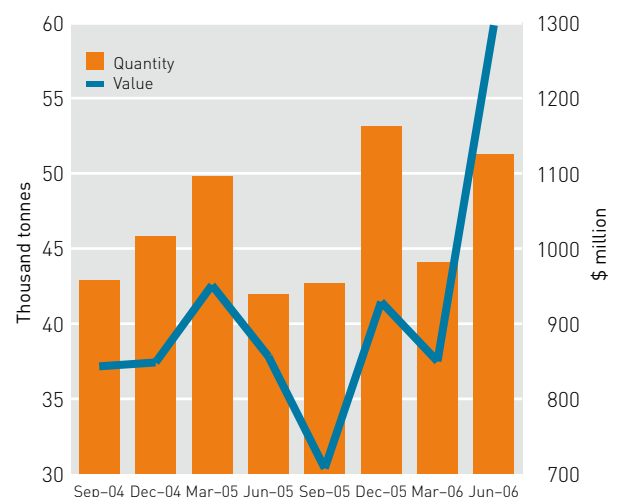


Figure 33 | **Nickel Quantity and Value by Quarter**
Source: DoIR

2. MINERALS AND PETROLEUM INDUSTRY 2005–06 REVIEW

The combination of Western Australia's large nickel reserves and buoyant nickel prices has resulted in a range of exploration and development activities. Among the most significant is BHPB's \$1.8-billion Ravensthorpe nickel laterite project that is envisaged to produce up to 220 000 tonnes per annum of nickel-cobalt hydroxide with a mine life currently expected of around 25 years. First production is expected some time in the third quarter of 2007. Production will be shipped to the BHPB's metal refining section of the Yabulu refinery near Townsville in Queensland. Ravensthorpe will rival Murrin Murrin as Western Australia's second-largest lateritic nickel mine. The Western Australian Government is contributing about \$24 million to common-user infrastructure in the region.

Other projects under consideration are:

- Heron Resources' Goongarrie laterite nickel project, located about 85 kilometres north of Kalgoorlie. Heron and Inco signed a formal agreement in 2005 under which they will complete a feasibility assessment and if warranted, develop the project.
- Jubilee Mines' Prospero deposit just 4.5 kilometres south of the Cosmos mine underwent a resource upgrade revealing a 31 per cent increase in contained nickel metal to 79 200 tonnes. Prospero is the centrepiece of a new mine development at Cosmos which includes the nearby Tapinos deposit.
- BHPB's Yakabindie project is based on a large nickel deposit situated near their existing Mount Keith operation. BHPB is conducting a pre-feasibility study with consideration being given to developing Yakabindie as an integrated part of the Mount Keith project.
- The Sherlock Bay Nickel Company is currently undertaking a major review of its Sherlock Bay nickel project (9000 tonnes per annum) with the key focus over the next 12 months to complete the necessary metallurgical test programs which remain on the critical path for project development.

The 2006–07 year will see the continued ramping-up of Consolidated Mineral's East Alpha mine, located five kilometres southeast of Kambalda, which commenced production in late March 2006. This will consolidate a 9–10 000 tonnes per annum nickel production complex through combined production from Beta Hunt and East Alpha.

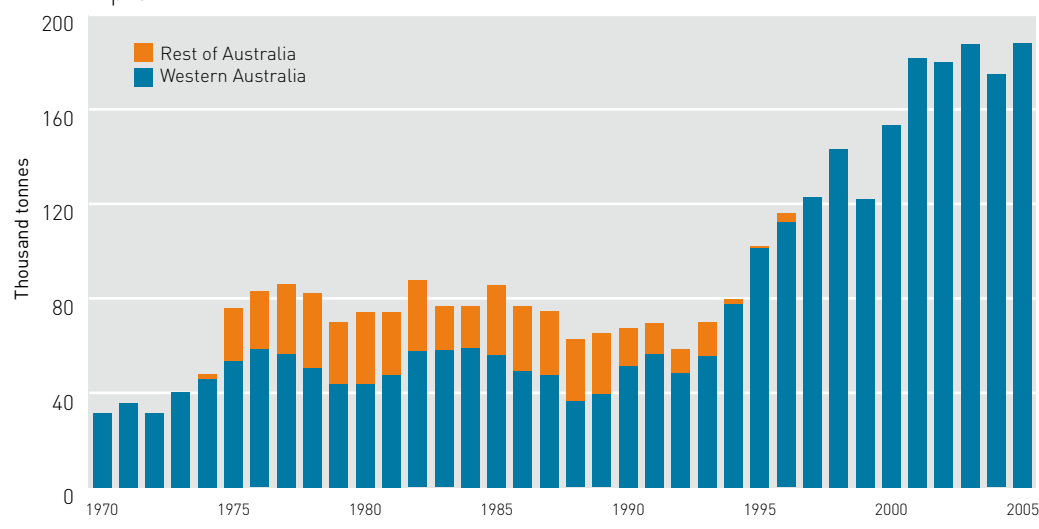


Figure 34 | Nickel Quantity Source: DoIR and ABARE

With the completion of LionOre's Maggie Hays mine upgrade, it is anticipated that production will increase by approximately 20 per cent to over 14 000 tonnes per annum payable nickel by the end of 2006. The upgrade includes an expansion of the existing underground mining operations as well as an upgrade of the processing plant capacity to 1.5 million tonnes per annum.

In addition to the Maggie Hays upgrade, LionOre's Black Swan \$69-million Disseminated 2 project involving pit expansion, plant construction and processing plant capacity upgrade to 2.15 million tonnes per annum, is on track and is scheduled for commissioning in the third quarter of 2006. Ramp-up to full production is expected in the fourth quarter of 2006.

A bankable feasibility study is also due for completion in the second quarter of 2007 on LionOre's Honeymoon Well project. Amongst one of the world's largest undeveloped nickel deposits, Honeymoon Well is located 53 kilometres northeast of Kalgoorlie. It is envisaged that the project would operate at around 10 million tonnes per annum producing in excess of 40 000 tonnes per annum of nickel in concentrate.

Following an increase in resource inventory, Western Areas' new nickel sulphide concentrator at Forrestania, which is expected to be commissioned by the end of 2006, will also add to increased production for the forthcoming period. The first few months of high-grade ore produced from their Flying Fox tenement will be treated at the Emily Ann plant under the terms of an existing agreement with LionOre until the Forrestania plant is available.

Subject to the expected continued high level of growth in China with infrastructure development, construction and manufacturing, being the main feature of rising stainless steel consumption, the outlook for Western Australian nickel operations remains strong. Record prices, various mine expansions and new mines coming on-stream will ensure a very active period for the State's nickel industry in 2006–07. Western Australia is also likely to continue to account for all of Australia's nickel mining in 2006–07.

Globally, nickel production for the coming year is expected to increase with the ramping-up of Inco's Voisey Bay nickel mine in Canada (55 500 tonnes per annum capacity) being the main source of the increase. Production is expected to rise further with the start-up in late 2007 of BHPB's Ravensthorpe mine (50 000 tonnes capacity) and Inco's Goro mine (60 000 tonnes capacity) in New Caledonia.

2.6 Gold

In 2005–06, the gold industry, at \$3.6 billion, ranked as the fifth-largest commodity sector in Western Australia, accounting for eight per cent of the State's total mineral and petroleum sales. On a national scale, in 2005–06, Western Australia accounted for around 70 per cent of Australia's gold production. Surbiton statistics show that Australia's gold production fell to 233 tonnes (7.5 million ounces) or six per cent in 2005–06 compared to 2004–05.

Western Australia's gold sales in 2005–06 amounted to 5.2 million ounces (161 tonnes), representing a four per cent decrease compared with the previous year. Some operations have had to rely on treatment of lower grade stockpiles in the March quarter due to the effects of the wet weather caused by seasonal cyclonic activity. However, the higher prices have allowed producers to profitably reduce head grades.

The increase in the gold price helped boost the value of the State's gold sales to \$3567 million, an increase of 18 per cent.

In 2005–06, the average international price of gold was US\$527 per ounce, up 25 per cent compared to the previous financial year. Since the start of 2006, the gold price has remained in the spotlight following its upward trend in the last half of 2005, peaking in May at US\$725 per ounce. In Australian dollar currency terms, the average gold price was 24 per cent higher, up from \$562 per ounce in 2004–05 to \$705 per ounce in 05–06. In mid-May 2006, gold hit an all-time record in Australian dollar terms of \$933.20 per ounce.

The gold sector is also a significant employer, accounting for about 28 per cent of total employment in the mineral and petroleum sector in Western Australia. The number of people employed within the gold industry in 2005–06 was more than 12 500, up by three per cent on 2004–05.

Western Australia's ten largest projects accounted for 72 per cent of the State's gold output in 2005–06. These projects comprised:

- Golden Mile (Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM)) – 23.4 tonnes
- St Ives (Gold Fields Ltd) – 15.5 tonnes
- Telfer Gold (Newcrest Mining Limited) – 14.3 tonnes
- Sunrise Dam (AngloGold Ltd) – 13.0 tonnes
- Granny Smith (Placer Dome Inc) – 13.9 tonnes
- Jundee Nimary (Newmont Mining Corp) – 9.8 tonnes
- Kanowna Belle (Placer Dome Inc) – 7.9 tonnes
- Plutonic (Barrick Gold Corp) – 7.3 tonnes
- Agnew (Gold Fields Ltd) – 6.9 tonnes
- Marvel Loch (St Barbara Limited) – 5.1 tonnes

Exports of gold from Western Australia totalled \$7.2 billion for 2005–06 however only 49.5 per cent of this amount can be attributed to being sourced from Western Australian mines (see Gold Export Update 2005–06 in this section). India topped the export destinations again with 39 per cent followed fairly closely by the United Kingdom with 33 per cent, Thailand ten per cent, Japan five per cent, Vietnam three per cent and South Korea two per cent. India's share of exports has decreased from 2004–05 where it took half of the total exports from Western Australia. Although the United Kingdom is credited with taking 33 per cent of exports in 2005–06, it should be noted that with London having a central role in the gold market, when the Asian market falls and demand is depressed elsewhere, gold can be shipped to London to be on-sold from London accounts.

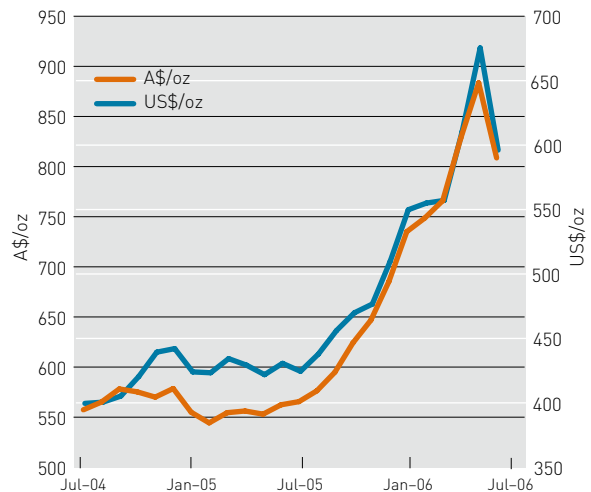


Figure 35 | **Gold Price** Source: Perth Mint and London Fix

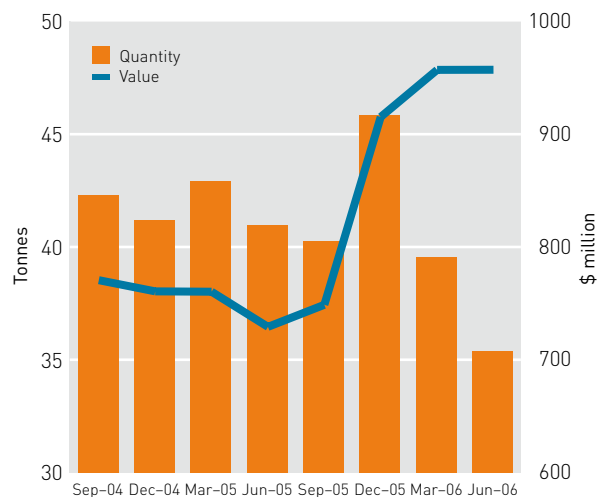


Figure 36 | **Gold Quantity and Value by Quarter** Source: DoIR

2. MINERALS AND PETROLEUM INDUSTRY 2005-06 REVIEW

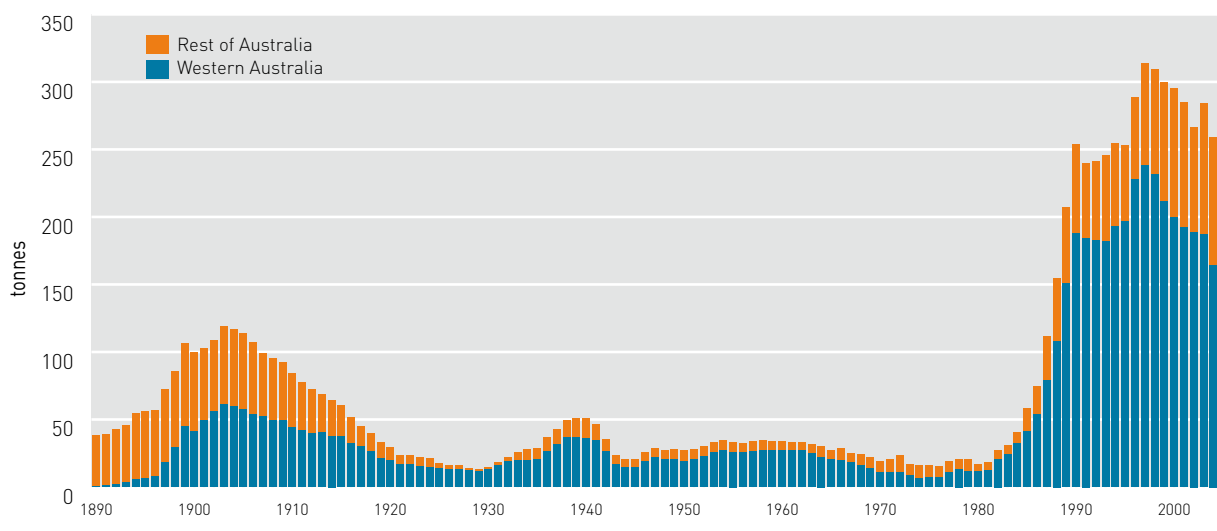


Figure 37 | **Gold Production** Source: DoIR and ABARE

GOLD EXPORT UPDATE 2005-06

The Australia Bureau of Statistics (ABS) released trade data that indicated a significant rise in Western Australian gold exports. However, this apparent increase in gold exports from Western Australia has been due to a restructuring of Australia's gold refining industry.

In October 2002, AGR Matthey was formed. This is a partnership between Johnson Matthey (Aust) in Victoria, WA Mint (The Perth Mint) and the Australian Gold Alliance. As a result of the merger, all Australian gold is now refined in Western Australia. The Victorian refinery still refines silver and jewellery products.

Gold export data published by the ABS from Western Australia must therefore be interpreted with some caution. It includes gold produced in other States and Territories, in addition to production from overseas operations, namely Papua New Guinea and Asia, which is refined and exported from Western Australia. This export figure is therefore larger than Western Australia's own level of gold production.

The ABS estimates that gold exports from Western Australia in 2005-06 amounted to approximately \$7.2 billion. Approximately 49.5 per cent or \$3.6 billion was gold produced in Western Australia. The remaining 50.5 per cent (approximately \$3.6 billion) can be attributed to gold refined and exported from Western Australia, but produced from mining operations in other States, Territories and overseas.

Overseas imported gold also includes scrap which is refined in Western Australia and exported.

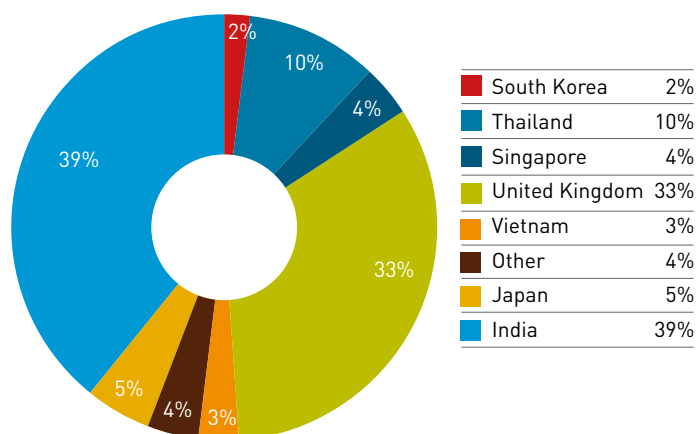


Figure 38 | **Gold Exports**
Total Value \$3.57 billion Source: DoIR and ABS

Using GFMS Ltd data the World Gold Council report that world total end-user demand for gold fell by 11 per cent to 3400 tonnes however in value terms it rose by ten per cent to reach US\$57.5 billion. Jewellery consumption fell some 16 per cent to 2400 tonnes and identifiable investment demand for gold remained almost static at 606 tonnes.

In terms of the State's gold production outlook, there are several gold projects looking at re-opening and some current producers looking to expand, due to the higher gold price. The effect of higher prices does not necessarily lead to a rapid rise in gold output but allows producers to adjust head grades to maximise mine life and subsequent returns. Some feasibility studies, previously shelved, are also being re-examined based on the high price, including:

- The Laverton Exploration Joint Venture Whisper project (located near Laverton in Western Australia) feasibility study, which was deferred in June 2005, is to be reviewed due to the increase in the gold price. The Whisper deposit is part of a larger oxide resource comprising the Rumour, Innuendo, Beasley Creek and Garden Wall deposits.

- Newmont Mining Corporation in Joint Venture with Anglo Gold Ashanti Limited's expansion of the Boddington gold mine (Wandoo). Production will be up to 600 000 ounces per annum of gold and about 20 000 tonnes per annum of copper in concentrates over a 15-year life. Initial production is not expected until late 2008.
- Kalgoorlie Super Pit – Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM) plans to extend the life of its open-cut mine by five years to 2017 with the Golden Pike Cutback. KCGM is in the process of finalising its Public Environmental Review for release by the EPA for public comment.
- The refurbishment of Gleneagle Gold Ltd's Fortnum gold project was completed in early July 2006 when it poured its first gold. Plant throughput is expected to ramp-up to the forecast one million tonnes per annum rate during the September 2006 quarter. Mining will be from the Toms and Eldorado pits and the operation has an initial mine life of around three years producing a total of 156 000 ounces of gold.
- Tectonic Resources NL's Phillips River gold project upgrade is targeting to be in gold production prior to the end of the first quarter of 2007 and is projected to produce a total of 246 000 ounces of gold, 550 000 ounces of silver and 8350 tonnes of copper.
- View Resources Limited is looking to re-open its Bronzewing mine 117 kilometres southeast of Wiluna.
- Wedgetail Exploration NL has been making solid progress into the planning and development of its Nullagine gold project about seven kilometres south of Nullagine. The mine is expected to have an initial five-year life producing around 70 000 ounces per annum. Production is targeted to commence in the first half of 2007.
- Reed Resources announced a 75 per cent increase in gold resources at the Sand Queen gold mine situated at Comet Vale some 100 kilometres north of Kalgoorlie. The first toll milling campaign was completed in June 2006 and at the current level of production (20 000 ounces per annum) potentially extends the mine life to beyond six years.
- Range River Gold Ltd expects to produce first gold from its Indee heap leach operation located 80 kilometres southwest of Port Hedland in the third quarter of 2006.
- Following the re-estimation of their mineral resource, Westonia Mines believes that the basis for project re-development has been established and will rework its feasibility study into the Westonia project and expects to complete this work by the September 2006 quarter.
- Integra Mining Limited has published promising results of its pre-feasibility financial outcomes on its Aldiss-Randalls deposit 130 kilometres east of Kalgoorlie. The modelling indicates a four-year mine-life producing up to 115 000 ounces per annum.
- In May 2006, revised mineral resource estimates announced by Saracen Mineral Holdings Limited at its Carosue Dam project have revealed significant increases in resources. The revised estimate is some 650 000 ounces of gold which will enable the deposits to be re-evaluated economically.
- St Barbara Limited is carrying out feasibility work to determine the viability of commencing mining at the earliest possible time at their Gwalia Deeps and Tarmoola open pit projects. Feasibility work is expected to be completed some time in the September 2006 quarter.
- Avoca Resources Limited continues their pre-development activities at Trident with the feasibility remaining on track for the end of August completion. Dewatering of the north end of the Poseidon South pit has been successfully completed with refurbishment of the historic underground workings to commence in the third quarter of 2006.
- Prospect Resources continues to progress the feasibility for gold mining at its Melville deposit with an estimated 50 000 ounces of gold.

The direction of gold prices in 2006–07 will largely depend on world economic growth. Other uncertainties and risks that may significantly affect gold prices include the value of the US dollar, ongoing threats of terrorism and regional political tensions in the Middle East and North Korea.



Figure 39 | Historic Gold Price US\$/A\$ per ounce Source: World Gold Council

2. MINERALS AND PETROLEUM INDUSTRY 2005–06 REVIEW

2.7 Base metals

The overall value of the Western Australian base metals sector rose by a staggering 186 per cent to reach \$821 million during 2005–06. The increase was primarily due to new projects coming on stream, increased production from nickel producers, the Telfer operation and very strong international prices for base metals. On average, throughout 2005–06, in Australian dollar terms, zinc rose an amazing 83 per cent, copper increased 62 per cent and lead, a more modest but nonetheless impressive, 12 per cent. In value terms, this puts base metals ahead of heavy mineral sands for the first time.

The overall largest producer of base metals by value in Western Australia is Oxiana Limited with its Golden Grove project located approximately 450 kilometres northeast of Perth. Oxiana acquired Golden Grove from the Newmont Mining Corporation in July 2005. The Golden Grove project produces zinc concentrate and copper concentrate which also contains silver, gold and lead. Product is exported to China, South Korea, Thailand and India.

COPPER

Copper production in Western Australia may be split into three categories comprising copper concentrate, copper cathode and copper by-product (mainly from nickel mining). During 2005–06, the total quantity of copper sold increased by around 15 per cent whilst the value rose 65 per cent to \$403 million. Copper prices reached record levels of US\$3.99 per pound in May 2006.

Newcrest Mining Limited's Telfer gold project, 310 kilometres northeast of Newman, is the largest single producer of copper and reported producing a total of 38 374 tonnes of copper in concentrate for the 2005–06 period.

Aditya Birla Minerals Ltd operates the Nifty copper mine located 150 kilometres east of Nullagine. Nifty currently has a capacity of 25 000 tonnes per annum of copper cathode and also has a large undeveloped copper sulphide resource estimated to be around 1.9 million tonnes of copper equivalent. A detailed feasibility study has recently been concluded for the development of an underground mine and a copper concentrate plant with a projected capacity of 2.5 million tonnes per annum at Nifty.

Straits Resources Limited operates the Whim Creek, Mons Cupri copper cathode project located midway between Karratha and Port Hedland. During the 2005–06 period, it produced a total 15 546 tonnes of copper cathode; however, not all of this production is reported to DoIR, as the Whim Creek tenements are not covered by the *Mining Act 1978*.

Golden Grove reported producing 15 295 tonnes of copper concentrate for the period.

Of the thirteen nickel operations which produce copper as a by-product in concentrate, Sally Malay Mining Corporation's Sally Malay project contributed over 35 per cent of the total 9.9 tonnes for the 2005–06 financial year.

LEAD

The only current stand-alone lead producer in Western Australia was commissioned in 2005 and officially opened in September 2005. Ivernia's Magellan lead operation, located 30 kilometres west-northwest of Wiluna, is considered amongst the top five lead-producing mines in the world (when in full production). It has a mine life of approximately ten years.

For 2005–06, Magellan produced 50 800 tonnes of lead in concentrate. This was lower than expected and like a lot of mining operations in Western Australia, the mine was affected by adverse weather conditions early in 2006. This impinged on the concentrate drying and shipping processes.

Shortages of road and rail transport capacity due to the high level of activity in the Western Australian resource sector also impacted on shipping. The bulk of Magellan's shipments were made to smelters in China, with Belgium, South Korea and Thailand receiving smaller quantities.

Golden Grove's reported production of lead for the 2005–06 period was 7939 tonnes in concentrate. With the proposed re-opening of the Lennard Shelf operations in the Kimberley, there will be two operations in 2007 producing lead in concentrate as a by-product.

ZINC

Golden Grove currently produces all of Western Australia's zinc in concentrate. Oxiana reported production of 107 863 tonnes for 2005–06 whilst LME prices reached record levels in May of US\$1.81 per pound. All of Golden Grove's zinc is sold to smelters in Asia under long-term supply contracts.

The high price of zinc has prompted Teck Cominco to re-open the Lennard Shelf mining operation. First concentrate production is planned for early 2007. Located 25 kilometres southeast of Fitzroy Crossing in the Kimberley region of Western Australia, the mine is expected to produce 70 000 to 80 000 tonnes per annum of zinc for four to five years. Mill start-up is anticipated for January 2007 with full production by the end of the first quarter of 2007. The estimated capital cost to restart the operation is \$23 million with an additional \$5 million in pre-production costs.

2.8 Mineral sands

Western Australia remains the nation's dominant producer of heavy mineral sands accounting for around 88 per cent by total value sold in 2005. During 2005–06, the value of Western Australian mineral sands remained almost static (\$800 million) when compared with 2004–05. However quantities sold fell in nearly all instances with the exception of leucoxene which rose by around seven per cent. By tonnage, ilmenite fell 22 per cent, synthetic rutile was down six per cent, rutile fell 17 per cent and zircon was down by 12 per cent. A 13-week outage for the relining of a kiln at Iluka's Narngalu synthetic rutile plant, reduced production, however the company reports that the outage did not affect sales tonnage.

Export markets for Western Australian heavy mineral sands are very diverse with the United States accounting for 23 per cent, China and the United Kingdom both taking 12 per cent, Italy nine per cent, Spain eight per cent, Taiwan seven per cent, the Netherlands six per cent, Saudi Arabia and Japan five per cent each and 12 other countries accounting for the balance.

As indicated by the shipped tonnages, with values remaining static, prices received by Australian producers of heavy mineral sands during 2005–06 were on average up. Prices for titanium dioxide (TiO₂) pigment rose by over three per cent, ilmenite prices increased eight per cent, leucoxene prices rose eight per cent, rutile climbed by 14 per cent and zircon prices grew by 19 per cent.

Western Australia is dominated by two major producers, Iluka Resources Ltd and the Tiwest Joint Venture, which is a joint venture between Tronox Western Australia Pty Ltd., a subsidiary of Tronox Incorporated, and the subsidiaries of Australian-based Ticor Resources Pty Ltd. These two producers account for around 90 per cent (by value) of all Western Australian heavy mineral sands sold in 2005–06.

Iluka's operations include Yoganup Extended, Yoganup West and the Wagerup mines as well as two dry separation plants and a synthetic rutile processing plant located at North Capel and Capel in the southwest of the State. Capel is about 200 kilometres south of Perth and processed product is shipped through the nearby Port of Bunbury.

Narngulu is the processing centre for Iluka's operations in the Mid West and is located on the outskirts of Geraldton, 410 kilometres north of Perth. Titanium minerals and zircon from the Eneabba (260 kilometres north of Perth) and Gingin (80 kilometres north of Perth) mine sites are processed at Narngulu before they are exported through the Geraldton Port. The processing facilities consist of a dry separation plant, zircon finishing plant and a synthetic rutile processing plant.

Government approvals were given for Iluka to develop two new mine sites in 2006. Cataby approval was received in April and Waroona in August 2006. Cataby is located approximately 150 kilometres north of Perth and covers a mineral resource approximately 25 kilometres long. It has an expected mine life of five years with 13 pits being mined progressively by dry mining techniques using a combination of scrapers, front-end loaders, excavators and haul trucks. Construction is to commence in late 2006 with production planned for late 2007.

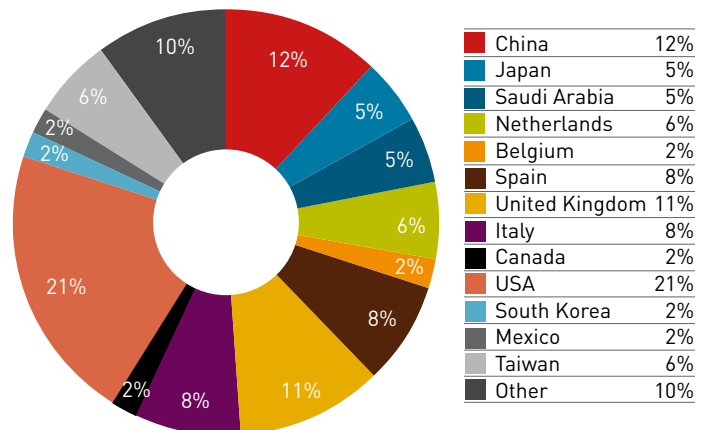


Figure 40 | **Heavy Mineral Sands Exports**
Total Value \$646.35 million Source: DoIR

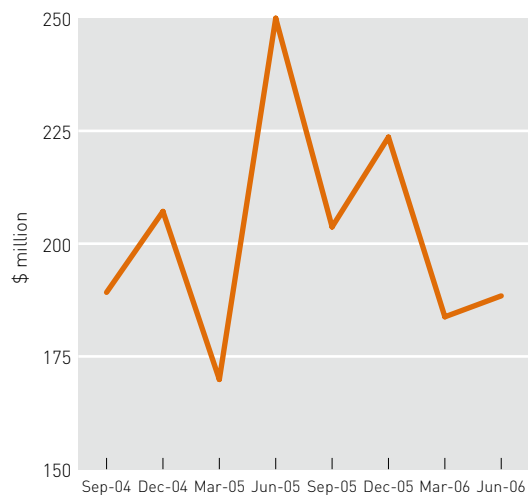


Figure 41 | **Heavy Mineral Sands Value by Quarter** Source: DoIR

The new Waroona mine, approximately 140 kilometres south of Perth, covers approximately 180 hectares of land and has an expected mine life of four years with construction already started in August and mining to commence in early 2007. Dry mining techniques will also be used at Waroona.

TiWest's Cooljarloo mine is situated approximately 170 kilometres north of Perth. Ore is processed through concentrators before being transported in specially designed road trains from the mine site at Cooljarloo to the dry mill, 110 kilometres to the south, at Chandala. The Chandala complex includes three major plants – a dry mill, which separates the minerals, a synthetic rutile plant, which upgrades ilmenite into high quality titanium dioxide pigment feedstock, and a waste management plant. Using technology developed in Western Australia – the Improved Becher Process – Tiwest upgrades the titanium dioxide content in ilmenite from an average 61 per cent to at least 93 per cent in synthetic rutile.

2. MINERALS AND PETROLEUM INDUSTRY 2005-06 REVIEW

Not all synthetic rutile from Chandala is exported. A large quantity is railed to Tiwest's Kwinana pigment plant where it is transformed into pure white pigment, TiO_2 , which is used as a commercial colouring agent and coating material. The Kwinana facility is a cogeneration plant, where a gas turbine generates electricity and the exhaust gases, which would in the past have been vented into the atmosphere, are used to raise steam for use in the pigment plant. The plant generates all of Tiwest's power requirements, plus surplus electricity for the South West Interconnecting Grid.

Bemax Resources Limited through its wholly owned subsidiaries that make up the Cable Sands Group are the next largest operator with its Ludlow and Tutanup South mines. Cable Sands' Bunbury Mineral Separation Plant (MSP) treats feedstock from the company's own mines as well as on a toll treatment basis for a number of customers. During 2005, the MSP underwent a \$6-million upgrade to allow it to simultaneously process feedstock from both its Western Australian and Murray Basin operations in South Australia.

Doral Mineral Sands Pty Ltd is the smallest of the Western Australian mineral sands producers located at Dardanup and Picton some 20 kilometres and 10 kilometres east of Bunbury. The company is a wholly owned subsidiary of Perth-based Doral Mineral Industries Limited, itself an unlisted public company owned by Iwatani International Corporation of Japan. Ore at Dardanup is concentrated and trucked nine kilometres to the continuously operated Picton dry separation plant. Product is then exported from the nearby Bunbury Port.

It should be noted that not all heavy mineral sands mined comes under the *Mining Act 1978*. Some product is mined from land granted to private individuals prior to 1899 and as such is not reported to the Department.

TZ Minerals International Pty Ltd (TZI) reports that internationally, major cost increases, particularly higher energy and raw material costs, have led to little improvement in pigment prices in most regions for the first half of 2006. However, most producers reported increases in sale volumes for the first six months and remain optimistic for the remainder of the year.

TZI's Mineral Sands Annual Review 2006 also reports that global demand for titanium feedstock is forecast to increase to 5.64 million TiO_2 units in 2006 and is expected to rise to 6.00 million TiO_2 units by 2008. In contrast to the previous two years, during which feedstocks were in short supply, supply and demand in 2005 was close to being balanced. This is a temporary situation that will be reversed over the next three years. Overall pricing was expected to remain flat in 2007, but to regain momentum in 2008.

TZI also stated that for the third successive year the world market was undersupplied with an estimated 17 000-tonne deficit of zircon. Stocks were to have fallen to record low levels, well below what would be considered as an acceptable working stock level for the industry. With new zircon supply only set to enter the market from late 2006, tight market conditions were forecast during the next two years.

The development of supply deficits since 2003 has had a significant impact on zircon pricing. The average Australian export price for bulk zircon sand in 2005 was US\$630 per tonne (fob) and represented the seventh successive year of nominal and real price increases.

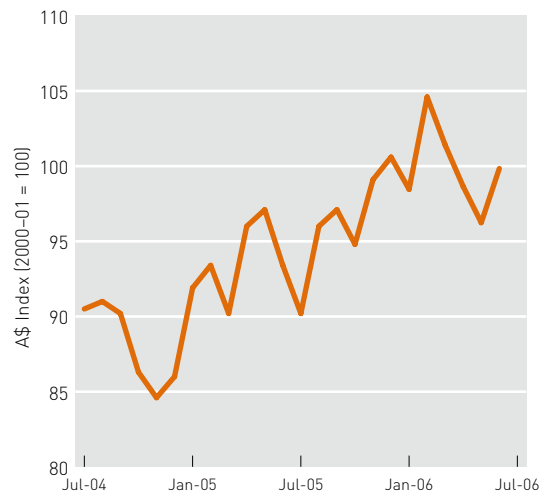


Figure 42 | **Heavy Mineral Sands Price Index**
Source: WA Treasury

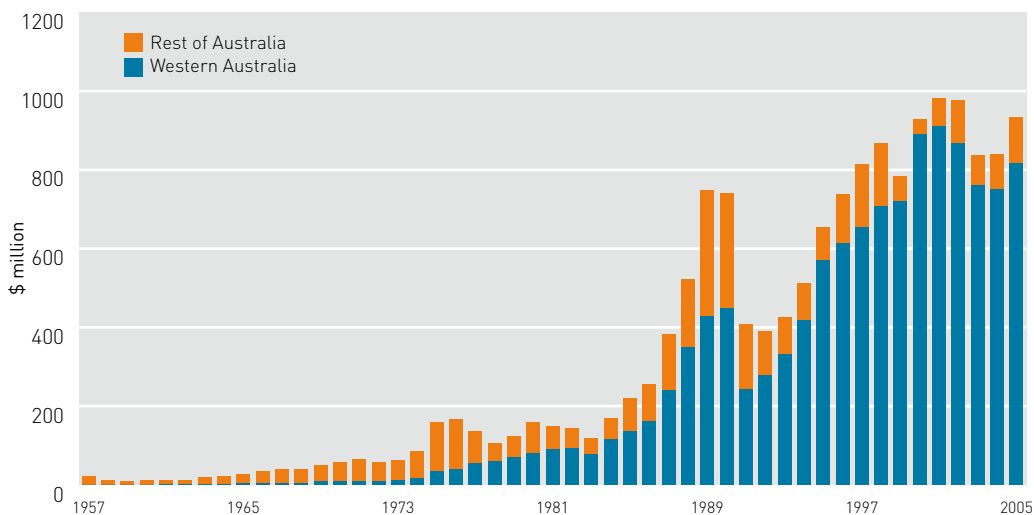


Figure 43 | **Heavy Mineral Sands Value of Production**
Includes Ilmenite, Leucoxene, Upgraded Ilmenite, Rutile, Zircon and Monazite
Source: DoIR and ABARE

2.9 Diamonds

Rio Tinto's Argyle mine, 112 kilometres south-southwest of Kununurra, accounts for the bulk of diamond production in Western Australia and in 2005–06 produced a little over 25 million carats. Cyclonic conditions hampered production creating flooding in the March quarter.

Argyle commenced mining its main ore body in 1985 and since that time has produced over 670 million carats of diamonds. The open pit resource is in decline and projected to be exhausted by around 2008 when plans are in place to go underground. In December 2005 Rio Tinto announced its decision to develop the underground project at the Argyle diamond mine with an additional US\$150 million to be spent on a related open pit cutback. This will extend the life of the operation to 2018.

The Argyle mine is famous for its pink diamonds and produces around 90 per cent of the world's production. It also accounts for the majority of natural-coloured diamonds in the market. The colour range includes white, champagne and pink. Argyle production consists of five per cent gem and 70 per cent near gem with the remaining 25 per cent of the volume being industrial diamonds.

The Kimberley Diamond Company with its Ellendale mine, 100 kilometres east of the coastal town of Derby (2000 kilometres north of Perth), is the State's only other producing diamond mine. Since mining began in mid-2002 the company has produced and sold 396 568 carats worth \$107 million. Expansions and upgrades will increase Ellendale's total processing capacity to more than 8.3 million tonnes per annum, from mid-2006 raising the company's annual production to more than 700 000 carats per annum.

Although the abnormally wet weather impinged on operations at Ellendale by closing the Gibb River Road (the only access road to the mine site) between January and April 2006, production during 2005–06 was in excess of 152 000 carats. Sales exceeded 146 000 carats and averaged US\$174 per carat. Mining operations returned to normal during June where record throughput was achieved. Ellendale has a projected mine life to 2014.

Gem diamonds share the podium with gold as a luxury commodity, principally in diamond rings to mark engagements and the special anniversaries of life and in other jewellery. Industrial diamonds have an important role as abrasives in sanding discs, circular saws, drilling bits and other machining processes.

2.10 Other minerals

COAL

All of Western Australia's coal supplies are sold domestically from Collie coal mines to Western Power Corporation and other large local energy users, mainly in the mineral-processing sector. Collie is located 50 kilometres inland from the coastal city of Bunbury, itself 150 kilometres south of Perth. In 2005–06, the value of coal increased by nine per cent to reach \$297 million, whilst volumes rose by seven per cent to 6.7 million tonnes.

About 90 per cent of Collie coal is used as thermal coal, mostly in power stations and the majority of the remainder is used metallurgically by the mineral sands industry to reduce ilmenite to synthetic rutile. A small quantity is used to reduce silica sand to silicon metal.

In August 2005, Wesfarmers Premier Coal Limited was successful in its bid to supply Western Power Corporation's long-term coal requirements from 2010 to 2030 for its coal-fired power stations at Collie in Western Australia. This contract will underpin the long-term future of the Premier coal mine for Wesfarmers.

The other Western Australian coal producer, Griffin Coal, commenced construction earlier this year on the State's first privately funded, owned and operated coal-fired power station, Bluewaters I. All Government, community, environmental and regulatory approvals for the \$400-million, 208-megawatt project have been received. Griffin was also nominated as the preferred supplier of power for the recently approved upgrade of the Boddington gold mine. Griffin is planning to combine the construction of both Bluewaters I and Bluewaters II.

Western Power Corporation will commence work in October 2006 to connect Griffin Coal to the South West Interconnected System and upgrade the distribution line between Collie and Boddington. This upgrade is scheduled to be completed in 2008, the same year the mine is expected to open and the Bluewaters power station will be operational.

Both coal producers are also examining other areas where they can expand the market for coal with coal carbonising projects whereby coal is transformed into a higher value product known as carbonised coal or char.

A possible new development in the Mid West region of the State is Aviva Corporation Ltd's Central West coal project near Eneabba, 270 kilometres north of Perth. Aviva plans to capitalise on the energy needs of the new Mid West iron ore producers and associated industrial and port infrastructure. A mining pre-feasibility study has been carried out including an iron-making scenario which includes capital costs for a coal preparation plant.

2. MINERALS AND PETROLEUM INDUSTRY 2005–06 REVIEW

SALT

Western Australia accounts for approximately 93 per cent of the nation's salt production and is the country's dominant exporter. In 2005–06 Western Australian salt sales fell by six per cent to 10.8 million tonnes. However buoyant prices saw the value rise by 13 per cent to \$230 million. Japan accounts for around 35 per cent of the State's exported salt, Taiwan 17 per cent, Indonesia and China import 15 per cent each, South Korea 13 per cent and other countries six per cent.

Dampier Salt Limited, with its Dampier, Port Hedland and Lake McLeod operations located in the Pilbara region, accounts for 75 per cent of the total salt produced in Western Australia.

Onslow Salt Pty Ltd's operation at Onslow (approximately 1000 kilometres north of Perth) is the next largest operation. The Shark Bay Joint Venture at Useless Loop (which commenced operations in 1968) and the WA Salt Supply's Lake Deborah East (at Koolyanobbing) and Pink Lake (at Esperance) operations make up the smaller producers.

A potential new entrant into Western Australia's solar salt industry is Straits Resources with its Yannarie project near Exmouth Gulf. Should approvals be granted, construction could commence some time in 2007 with salt production to follow around 2008–09.

Salt is primarily used as a feedstock for the production of chemicals, glass and plastic. In the context of growing demand from Asia, demand for salt is likely to continue to increase. Western Australian salt producers are therefore well placed, due to their proximity to the Asian markets, particularly in the context of rising freight rates for low-value bulk commodities.

TIN, TANTALUM AND LITHIUM

Tantalum is a rare, grey-blue metal used primarily in the electronics industry in the manufacture of capacitors and therefore found in many every day devices such as mobile phones, lap-top computers and video cameras. Another increasing application for tantalum is as an alloy in the manufacture of turbine blades for power stations and jet engines, where tantalum improves the structural integrity of blades at high temperatures, enabling turbines to operate at higher temperatures, thereby improving fuel efficiency.

There is little public information on the tantalum market and tantalum pricing. However, it appears that prices are currently depressed for raw material. Difficulty in establishing a price for tantalum is compounded by the many different types and grades of tantalum raw materials, all of which have implications for the refining process.

During 2005–06, Western Australia had two principal tantalum producers, Sons of Gwalia Limited (Administrators Appointed) (SOG) and Haddington Resources.

In August 2004, SOG went into voluntary administration and since then the tantalite market has continued to undergo major structural change. There has also been a downturn in the demand for tantalite with resultant depressed raw material price.

SOG announced in February 2006 that it would undertake an operational restructure following recent agreements reached with its two major customers for reduced sales volumes in return for, amongst other things, production and product specification flexibility. The restructure will maximise tantalum production at the Wodgina mine which is located 100 kilometres south of Port Hedland. The Greenbushes open cut operation, located 67 kilometres southeast of Bunbury, would operate on reduced tonnages and the underground tantalum operation will be put on "care and maintenance". Lithium production at Greenbushes will continue at capacity.

The Greenbushes and Wodgina mines together contain approximately 75 per cent of the world's defined tantalum reserves and currently supply more than half of the world's demand for tantalum. Both mines have a projected life in excess of 25 years. SOG has two long-standing tantalum customers, Cabot Corporation of the USA and HC Starck, a division of the Bayer Group of Germany. The company has sold all of its production to these two customers since 1991.

Tantalum production was also sourced from Haddington Resources' Bald Hill project in Western Australia's eastern goldfields. Haddington Resources operated Bald Hill under a licence agreement with SOG which had purchased concentrate under a take-or-pay licence agreement. This agreement expired at the end of March 2006 and the Bald Hill process plant will remain under care and maintenance until new customers for future production are found. Current operating costs and ore grades at Bald Hill are uneconomic at current concentrate prices.

Greenbushes also contains the largest hard rock, lithium mineral resource in the world and SOG is the world's largest producer of lithium minerals (spodumene) accounting for around 60 per cent of the world's supply. Lithium minerals are used in the glass and ceramics industries to improve product quality and enhance physical properties.

MANGANESE

Consolidated Minerals' Woodie Woodie mine is the State's sole producing manganese mine. During 2005–06, it reported production of 888 432 tonnes (up 46 per cent on 2004–05) for an estimated value of \$118 million. Long-term production levels of one million tonnes per annum are targeted for the future.

Reports from the Australian Stock Exchange and International Manganese Institute show that the benchmark price for manganese ore into Japan (concluded between BHP Billiton and Nippon Steel) were settled with a price increase of 63 per cent to apply to shipments from April 2005 to March 2006. This reflected record levels of demand for, and price of, carbon-steel products. The increase brought the benchmark price for manganese ore into line with the quarterly manganese prices achieved by Consolidated Minerals during 2004 and also supported Consolidated's ongoing quarterly price negotiations under its long-term supply contracts with China and Europe.

Another manganese benchmark price for 2006–07 was announced in December 2005 as US\$3.00 per dry metric tonne unit. While off the extraordinary highs of 2005–06, it is 33 per cent more than the average price of US\$2.25 per dry metric tonne unit during the previous ten years and reflects underlying strong world demand for raw steel-making materials.

Woodie Woodie is recognised worldwide as a supplier of reliable high-grade, low impurity manganese ore. Located 300 kilometres southeast of Port Hedland in the Pilbara region, the open cut mine was first established in 1954 with production peaking around 1970. It continued operating until 1982 when it closed for a period of some seven years. The mine re-opened again in 1989 and currently exports to around nine different countries. The company has long-term sales agreements in place with China and Europe covering more than 75 per cent of its annual production. Annual sales contracts are also negotiated with Japan, South Korea and Taiwan. China took around 70 per cent of the total Western Australian manganese exports for 2005–06 and Australia is its leading supplier.

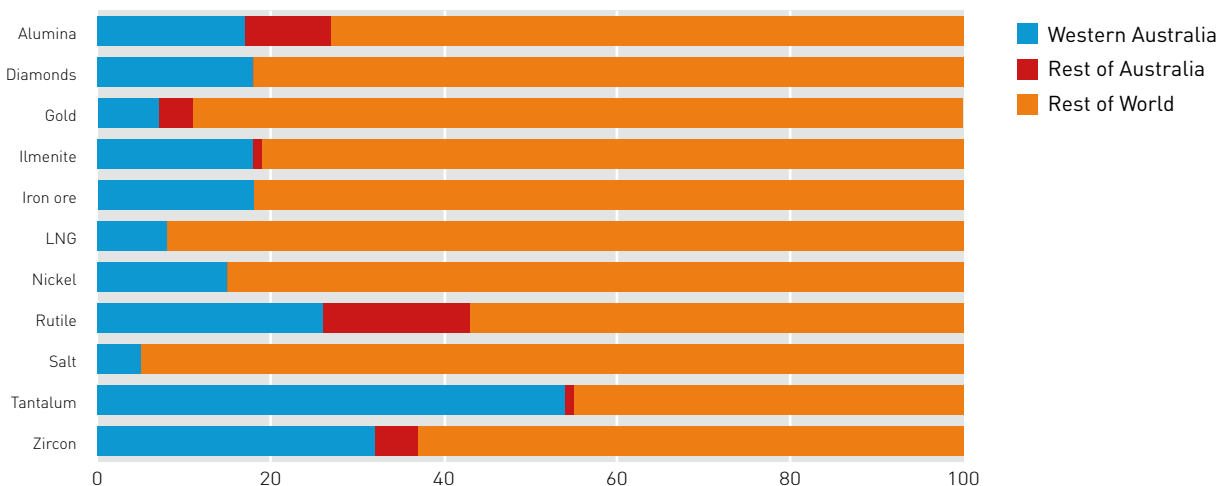


Figure 44 | **Selected WA Commodities Relative to World Production Ending 2005 by Quantity** Source: DoIR, ABARE, USGS

The latest comparable data show that the Western Australian share (by quantity) of the world's output of the following products was: alumina 17%, gold 7%, ilmenite 18%, iron ore 18%, LNG (sea borne trade) 8%, nickel 15%, rutile 26%, salt 5%, tantalum 54%, zircon 32% and 18% of diamonds (mainly industrial grade)

3. ROYALTIES AND EMPLOYMENT

Total royalties received from mineral and petroleum producers within Western Australia passed the \$2 billion mark for the first time with \$2.09 billion collected during the 2005–2006 financial year.

The \$2.09 billion includes royalties collected on behalf of the Commonwealth from the NWS project (where the State receives 60 to 68 per cent of royalties) and royalties which are collected from the Territorial Sea subsisting permit areas and Barrow Island, that are shared with the Commonwealth.

The Western Australian share of actual royalties paid into the Consolidated Revenue Fund amounted to \$1.7 billion in 2005–06.

Increased international oil prices meant the bulk of collections came from the petroleum industry with about half of all royalties coming from the North West Shelf Project. Although the mineral industry had several high performers in gold, nickel and diamonds, a third of all royalty collections came from the iron ore industry which benefited from a 71 per cent price increase in 2005.

This trend in iron ore is likely to continue into the future with prices increasing again by 19 per cent this year and BHP Billiton and Rio Tinto announcing major increases in production. Increased activity and a drive for greater efficiencies have been contributing factors for the recent Phase 3 development of the Royalties Management System (RMS) which administers royalty collections.

RMS has been in operation for several years and new system improvements are aimed at encouraging industry to lodge and pay royalties online. The system’s forecasting capabilities are currently being upgraded to address the Government’s requirements for timely and accurate details for use in its planning for future expenditures on such items as public utilities and infrastructure.

With increased economic activity from emerging countries such as China and India and continued strong prices, royalty collections are expected to remain above \$2 billion for a number of years.

The Department of Industry and Resources’ mining employment statistics are compiled from information provided by the Department of Consumer and Employment Protection. This information comes from monthly industry returns supplied for the purpose of monitoring the number and nature of workplace accidents. The employment figures published reflect the average number of workers on the mine sites including contract workers.

Petroleum employment data is provided by each producer directly to DoIR and reflects the average number of employees (including contractors) working on site. In the case of Chevron Australia Pty Ltd data reported includes total average Western Australian employment whilst Woodside Energy Limited figures are estimated as at 30 June 2006.

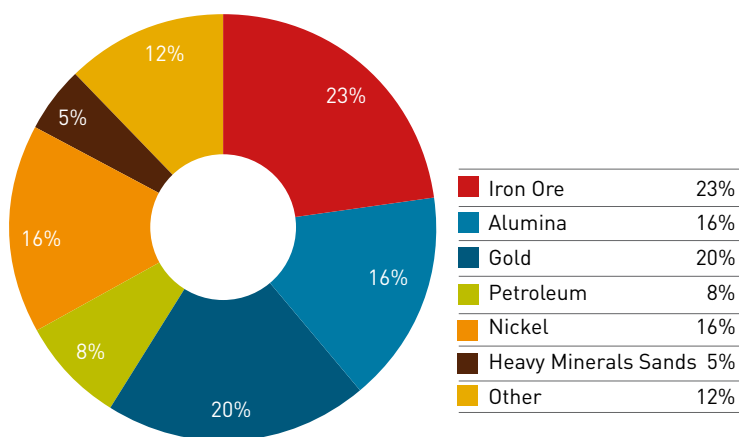


Figure 45 | **Minerals and Petroleum Employment 2005–06**
61,278 persons Source: DOCEP and Petroleum Producing Companies

It is no coincidence that the mining and related industries of Western Australia have been among those most affected by skills shortages. The rapid and somewhat unexpected rise (at least in magnitude) in overseas demand for the State's resource commodities, mainly from China and India, has meant that these industries have had to react quickly to increase production capacity. In the process the demand for skilled labour has also risen sharply.

Employment in the Western Australian mining and petroleum industries increased by around 6030 persons (11 per cent) between 2004-05 and 2005-06 to reach a record 61 278. This represents 8 per cent of total full-time employment in Western Australia. With the exception of gold, which fell 4 per cent, the number of persons employed rose across all sectors. Iron ore, gold, nickel, alumina and petroleum account for 84 per cent of all direct employment.

Using a multiplier of between 3.5 and 4, the total number of direct and indirect full-time employees associated with the resource sector, amounts to about 215 000. This represents around 30 per cent of Western Australia's full-time workforce in 2005-06.

During 2005-06, there was strong employment growth in technical business services, such as surveying and consultant engineering, much of which can be associated with mining operations in the State.

The recent expansion of Western Australia's resources sector has involved the construction of new infrastructure, which has increased the state's need for additional building and engineering professionals, as well as construction workers. ABS statistics show that from 2001-02 to 2004-05, Western Australian heavy industry engineering construction activity rose by \$1423 million (145 per cent), from \$985 million to \$2408 million. Heavy industry engineering construction activity includes the construction of production, storage and distribution facilities, refineries, pumping stations, mines, chemical plants, blast furnaces, steel mills, other industrial processing plants and ovens.

Other statistics show that from 2001-02 to 2004-05 engineers directly associated with the mining industry – mining and materials engineers – increased by 935 persons (66 per cent.) Civil engineers were up by 987 persons (36 per cent) and mechanical, production and plant engineers up 641 persons (24 per cent).

ABS labour force statistics for the State indicate continuing tight labour supply, characterised by the small pool of unemployed persons and historically high rates of labour force participation. The Department of Treasury and Finance has forecast employment in Western Australia to grow by two per cent in 2006-07 primarily based on an expectation that despite strong labour demand, employment growth will be constrained over the next few years by tight labour supply.

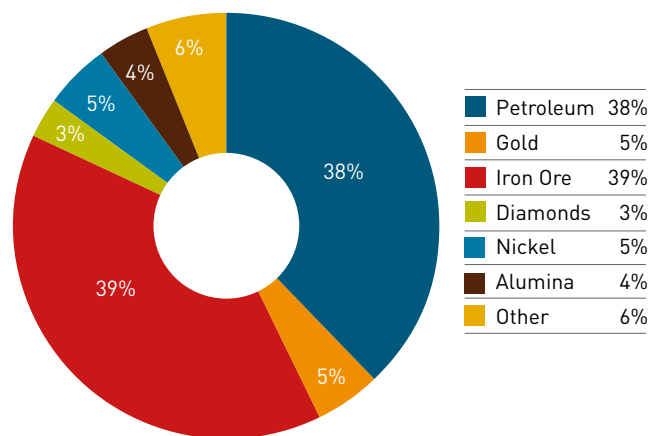


Figure 46 | Royalty Receipts 2005-06 Source: DoIR

Table 1 Quantity and Value of Minerals and Petroleum

Commodity	Unit	2004-05		2005-06	
		Quantity	Value	Quantity	Value
ALUMINA	t	11,162,619 (r)	3,461,633,038 (r)	11,466,687	4,111,251,807
BASE METALS					
Copper Metal	t	61,933 (r)	243,730,391 (r)	71,060	402,505,055
Lead Metal	t	2,324 (r)	313,649 (r)	58,739	86,549,244
Zinc Metal	t	48,400 (r)	42,418,636 (r)	107,863	332,112,685
TOTAL BASE METALS			286,462,676 (r)		821,166,984
CHROMITE	t	101,295 (r)	33,078,673 (r)	105,951	43,033,959
CLAYS			1,658,835		1,800,645
COAL	t	6,275,622 (r)	271,715,240 (r)	6,711,155	297,367,332
CONSTRUCTION MATERIALS					
Aggregate	t	430,979 (r)	4,069,958 (r)	932,280	22,472,730
Gravel	t	303,086 (r)	1,044,043 (r)	96,825	537,828
Rock	t	329,689 (r)	1,917,061 (r)	531,801	6,115,996
Sand	t	2,730,454 (r)	13,547,686 (r)	3,590,817	21,504,665
TOTAL CONSTRUCTION MATERIALS			20,578,749 (r)		50,631,219
DIAMONDS	ct	22,799,773 (r)	n/a	29,263,869	n/a
GEM & SEMI-PRECIOUS STONES	kg	550,767 (r)	n/a	235,257	n/a
TOTAL DIAMONDS, GEM & SEMI-PRECIOUS STONES			468,238,107 (r)		681,066,243
DIMENSION STONE	t	4,521	854,816	1,851	745,591
GOLD	kg	167,354 (r)	3,016,377,032 (r)	161,060	3,573,957,898 (e)
GYPSUM	t	1,407,689 (r)	23,724,041 (r)	1,578,206	26,485,751
HEAVY MINERAL SANDS					
Garnet	t	186,668 (r)	n/a	278,576	n/a
Ilmenite	t	707,121 (r)	79,548,045 (r)	554,469	61,572,051
Leucoxene	t	70,729 (r)	22,113,519 (r)	75,663	21,973,414
Zircon	t	420,039 (r)	298,369,892 (r)	371,559	326,604,041
Other			400,855,908 (r)		389,375,204
TOTAL HEAVY MINERAL SANDS			800,887,364 (r)		799,524,710

Table 1 Quantity and Value of Minerals and Petroleum

Commodity	Unit	2004–05		2005–06	
		Quantity	Value	Quantity	Value
IRON ORE					
Domestic	t	4,115,878	127,295,683	4,257,423	226,143,930
Exported	t	229,035,568	8,175,039,902	239,279,346	12,730,182,523
TOTAL IRON ORE		233,151,446	8,302,335,585	243,536,769	12,956,326,453
LIMESAND–LIMESTONE–DOLOMITE		4,001,157 (r)	38,753,542 (r)	3,908,057	37,933,674
MANGANESE ORE	t	606,944	116,320,952 (r)	888,432	117,972,661
NICKEL INDUSTRY					
Cobalt	t	4,499 (r)	202,378,324 (r)	5,069	183,482,569
Nickel	t	180,420 (r)	3,503,195,015 (r)	191,161	3,785,533,927
Palladium and Platinum By-Product	kg	1,051	9,150,844	622	5,037,065
TOTAL NICKEL INDUSTRY			3,714,724,183 (r)		3,974,053,561
PETROLEUM					
Condensate	kl	5,628,746	2,203,113,669 (r)	5,626,187	2,791,727,182
Crude Oil	kl	12,768,567	5,146,612,371 (r)	11,552,543	6,157,571,570
LNG	t	11,037,572 (r)	3,953,102,751 (r)	11,679,836	4,902,655,166
LPG - Butane and Propane	t	777,166 (r)	421,735,055 (r)	871,983	654,423,834
Natural Gas	'000m ³	7,642,801	678,722,971	7,713,414	703,282,553
TOTAL PETROLEUM			12,403,286,817 (r)		15,209,660,305
SALT	t	11,506,549 (r)	203,797,625 (r)	10,834,196	229,850,354
SILICA–SILICA SAND		700,240	6,155,323 (r)	778,115	7,779,625
SILVER	kg	108,616 (r)	34,140,716 (r)	100,258	35,819,470
TIN–TANTALUM–LITHIUM					
Spodumene	t	108,804 (r)	n/a (r)	193,229	n/a
Tantalite	t	1,063	n/a	871	n/a
Tin Metal	t	384 (r)	4,054,313 (r)	610	5,853,294
TOTAL TIN–TANTALUM–LITHIUM			184,027,435 (r)		170,457,141
OTHER (Includes Feldspar, Red Oxide, Spongolite, Talc and Vanadium)			17,160,929		13,432,566
TOTAL VALUE			33,405,911,679 (r)		43,160,317,948

Note: Quantities used in this table only apply to Minerals and Petroleum covered by the *Mining Act 1978*, the *Petroleum Act 1967*, the *Petroleum (Submerged Lands) Act 1982* and relevant State Agreement Acts.

(e) Estimate

(r) Revised from previous edition

n/a Breakdown of feldspar, garnet, red oxide, talc, spodumene, tantalite and vanadium not available

Table 2 Quantity and Value of Selected Major Commodities

	Unit	1996-97		1997-98		1998-99		1999-00	
		Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M
ALUMINA	Mt	8.35	1,955.77	8.51	2,260.54	8.86	2,367.03	9.35	2,657.89
BASE METALS									
Copper Metal	kt	27.73	58.98	29.43	61.12	24.44	43.71	30.73	64.62
Lead Metal	kt	13.49	6.09	27.00	10.45	51.55	17.25	64.47	20.24
Zinc Metal	kt	88.37	75.12	124.00	117.11	194.90	170.73	232.59	251.01
TOTAL BASE METALS			140.19		188.68		231.69		335.87
COAL	Mt	5.56	257.30	5.71	257.28	5.80	256.74	6.50	271.53
COBALT	kt	0.88	50.85	1.50	81.78	1.09	55.27	2.07	86.26
DIAMONDS ***	M ct	52.52	395.79	42.48	537.87	51.23	610.44	50.98	703.67
GOLD	t	228.02	3,409.61	239.46	3,468.95	219.26	3,219.52	204.96	2,951.26
HEAVY MINERAL SANDS									
Ilmenite	Mt	1.10	117.28	1.31	149.14	1.32	158.59	1.16	151.66
Rutile	kt	110.96	77.74	104.13	78.58	119.71	90.97	98.49	72.78
Upgraded Ilmenite (Synthetic Rutile)	kt	545.00	270.48	688.00	355.79	475.54	275.23	552.51	324.65
Zircon	kt	324.09	177.99	321.38	169.13	284.53	136.07	348.11	153.27
Other HMS			26.51		24.63		19.44		28.85
TOTAL HEAVY MINERAL SANDS			670.00		777.27		680.30		731.20
IRON ORE	Mt	141.29	3,159.65	149.74	3,930.77	141.03	3,898.53	151.16	3,722.12
MANGANESE ORE	kt	324.11	37.62	86.30	9.39	27.40	3.42	212.38	25.68
NICKEL	kt	114.10	1,051.11	135.19	1,146.64	125.77	876.62	143.93	1,806.29
PETROLEUM									
Condensate	Gl	5.73	943.15	6.76	1,065.84	5.55	743.91	6.35	1,583.94
Crude oil	Gl	10.47	1,915.93	9.85	1,567.16	9.16	1,189.64	12.05	3,144.77
LNG *	Btu 10 ¹² & t	370.50	1,528.77	379.54	1,591.94	391.90	1,434.42	393.61	1,971.06
LPG - Butane **	kt	209.69	59.67	376.09	90.47	388.69	90.62	443.58	190.90
LPG - Propane	kt	185.74	55.66	263.26	61.26	259.21	57.63	334.57	145.94
Natural Gas	Gm ³	6.89	534.65	6.88	557.47	6.44	549.83	6.55	578.76
TOTAL PETROLEUM			5,037.83		4,934.14		4,066.65		7,615.37
SALT	Mt	7.55	153.62	8.19	188.70	8.57	199.64	8.81	208.58
OTHER			141.33		153.07		189.73		229.26
TOTAL			16,460.67		17,935.08		16,655.58		21,344.98

* Expressed in million tonnes from 2004-05 onwards

** LPG Butane and Propane combined from 2004-05 onwards

*** Diamond values are not available from 2005-06 onwards and quantities are published production carats.

2000-01		2001-02		2002-03		2003-04		2004-05		2005-06	
Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M
10.48	3,600.67	10.86	3,584.38	11.13	3,204.65	11.17	3,085.11	11.16	3,461.63	11.47	4,111.25
42.62	111.12	53.50	122.57	59.45	138.78	53.29	155.82	61.93	243.73	71.01	402.51
82.33	37.31	75.08	36.72	70.02	31.85	29.45	10.57	2.32	0.31	58.74	86.55
236.01	280.24	223.67	173.82	206.45	173.19	108.04	79.55	48.40	42.42	107.86	332.11
	428.67		333.11		343.82		245.95		286.46		821.17
6.10	252.28	6.16	258.13	6.32	272.89	5.98	274.28	6.28	271.72	6.71	297.37
4.19	174.38	4.43	127.36	4.92	124.18	4.55	213.14	4.50	202.38	5.07	183.48
25.42	614.45	25.69	489.34	38.89	773.32	32.50	519.72	22.80	n/a	29.26	n/a
201.21	3,245.06	185.00	3,279.50	187.47	3,445.34	177.01	3,109.56	167.35	3,016.38	151.06	3,573.96
1.10	168.75	0.80	128.75	0.96	136.51	0.76	91.03	0.71	79.55	0.55	61.57
127.21	110.04	122.61	106.74	113.57	82.53	138.77	84.57	101.71	63.02	n/a	n/a
643.27	409.19	585.91	380.21	597.27	353.10	592.18	307.00	652.94	336.37	n/a	n/a
343.08	198.84	317.77	218.84	411.15	255.81	433.14	251.97	420.04	298.37	75.66	21.97
	18.08		19.78		16.86		20.53		23.58		715.98
	904.90		854.32		844.81		755.10		800.89		799.52
161.77	4,912.70	164.63	5,207.61	188.52	5,205.27	202.04	5,331.53	233.15	8,302.34	243.54	12,956.33
401.36	58.50	474.27	68.62	619.65	75.38	584.97	81.78	606.94	116.32	888.43	117.97
167.45	2,238.74	179.46	2,002.07	191.89	2,482.47	182.21	3,031.04	180.42	3,503.20	191.16	3,785.53
5.81	1,984.53	6.33	1,680.03	6.93	2,046.37	6.18	1,747.51	5.63	2,203.11	5.63	2,791.73
13.96	4,792.05	15.09	4,198.78	14.00	4,258.12	13.22	3,773.64	12.80	5,146.61	11.55	6,157.57
429.54	2,695.53	386.08	2,970.61	403.83	3,130.83	404.94	2,775.88	11.04	3,953.10	11.68	4,902.66
428.90	221.97	482.20	193.71	460.47	221.47	383.92	154.13	77.17	421.74	871.98	654.42
333.47	187.54	374.32	167.87	346.60	172.39	311.35	128.02				
7.63	630.36	7.53	643.28	8.12	661.92	8.06	694.07	7.64	678.72	7.71	703.28
	10,511.98		9,854.28		10,491.10		9,273.25		12,403.29		15,209.66
8.30	233.08	8.60	227.95	9.61	227.95	9.88	179.85	11.58	221.25	10.83	229.85
	371.67		409.47		366.48		316.87		820.06		1,074.23
27,547.08		26,696.14		27,857.66		26,417.17		33,405.91		43,160.32	

Table 3 Value of Minerals and Petroleum by Region 2005–06

Region	2005–06 Value	Region	2005–06 Value
Pilbara Region		South West Region	
Ashburton	5,008,902,026	Bridgetown–Greenbushes and Manjimup	166,523,863
East Pilbara	9,227,158,533	Bunbury	42,717,871
Port Hedland	83,263,172	Capel	217,895,053
Roebourne	14,185,519,638	Collie	297,590,372
Total	28,504,843,369	Dardanup	28,480,901
Goldfields–Esperance Region		Total	753,208,060
Coolgardie	1,565,654,390	Wheatbelt Region	
Dundas	324,362,241	Chittering	298,640
Esperance	579,374	Corrigin, Moora and Mukinbudin	1,075,664
Kalgoorlie–Boulder	1,407,908,580	Gingin	1,018,951
Laverton	901,753,692	Lake Grace	290,709
Menzies	10,928,020	Northam and Wyalkatchem	614,173
Ravensthorpe	8,892,117	Yilgarn and Nungarin	432,981,296
Total	5,718,870,052	Total	641,951,002
Peel Region		Gascoyne Region	
Boddington	1,016,207,267	Carnarvon	56,332,688
Murray	1,526,703,758	Exmouth, Shark Bay and Upper Gascoyne	17,056,324
Waroona	1,568,340,783	Total	73,389,012
Total	4,111,251,808	Perth Metropolitan Region	
Mid West Region		Cockburn and Rockingham	8,347,031
Carnamah	309,001,838	Kalamunda, Kwinana and Swan	7,206,307
Coorow	523,405	Wanneroo	14,042,598
Cue	23,369,792	Total	29,595,936
Meekatharra	210,277,735	Great Southern Region	
Mount Magnet	121,980,485	Albany, Kent and Plantagenet	5,274,803
Morawa, Mullewa and Perenjori	83,674,620		
Sandstone	46,399,623		
Three Springs	10,978,328		
Yalgoo	458,462,658		
Total	2,378,298,321		
Kimberley Region			
Broome	4,402,391		
Derby–West Kimberley	98,861,051		
Halls Creek	194,283,410		
Wyndham–East Kimberley	646,088,734		
Total	943,635,586		

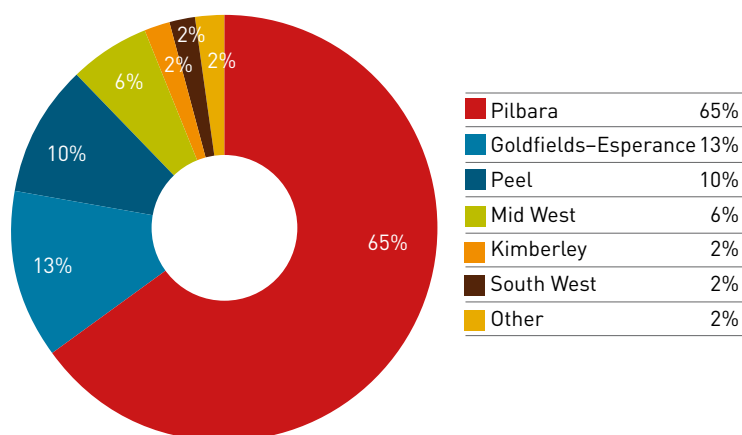


Figure 47 | **Regional Value of Minerals and Petroleum** Source: DoIR

Table 4 Royalty Receipts 2004-05 and 2005-06

COMMODITY	2004-05	2005-06	2005-06 Growth	
	Total A\$	Total A\$	A\$	%
ALUMINA	54,578,682	64,090,700	9,512,018	17
DIAMONDS	32,635,115	48,225,088	15,589,973	48
GOLD	72,914,303	81,622,995	8,708,692	12
HEAVY MINERAL SANDS	26,780,743	30,751,011	3,970,268	15
IRON ORE	380,332,086	679,628,477	299,296,391	79
NICKEL, (Includes, cobalt, palladium and platinum)	93,395,043	86,729,918	-6,665,125	(7)
PETROLEUM				
Oil and Condensate	302,255,315	332,802,982	30,547,667	10
LNG, LPG and Natural Gas	247,405,598	346,022,905	98,617,307	40
TOTAL PETROLEUM	549,660,913	678,825,887	129,164,974	23
OTHER	45,586,986	66,711,689	21,124,703	46
TOTAL REVENUE	1,255,883,871	1,736,585,765	480,701,894	38

Note: All Royalty Receipts above are only those paid into the State's Consolidated Revenue Fund during the period. It does not include royalty receipts collected on behalf of the Commonwealth.

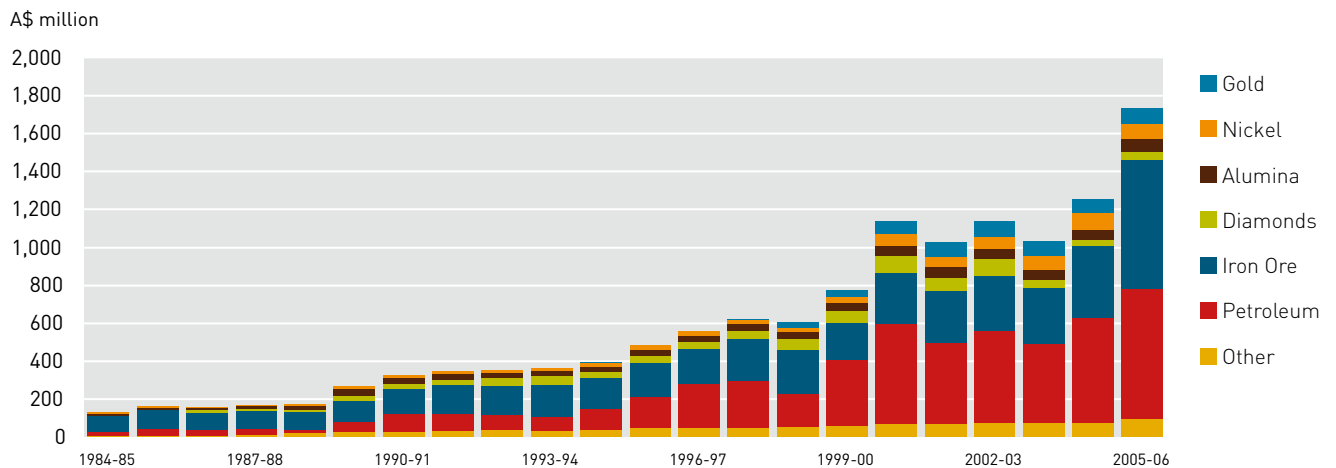


Figure 48 | Royalty Receipts by Commodity Source: DoIR

Table 5 Average Number of Persons Employed in the WA Minerals and Petroleum Industries

MINERAL/Company	Operating Site	2004-05	2005-06
ALUMINA			
Australian Fused Materials Pty Ltd	Rockingham Fused Alumina Plant	242	95
Alcoa World Alumina Australia	Huntly	852	620
	Kwinana Alumina Refinery	1,703	1,695
	Pinjarra Refinery	2,216	3,116
	Wagerup Alumina Refinery	1,077	1,222
	Willowdale	406	365
Worsley Alumina Pty Ltd	Worsley Mining Operations	282	293
	Worsley Refinery	1,928	2,447
TOTAL ALUMINA		8,706	9,853
BASE METALS			
Birla (Nifty) Pty Ltd	Nifty	499	825
Jabiru Metals Ltd	Jaguar	0	57
Magellan Metals	Magellan	72	143
Normandy Mining Ltd	Scuddles	408	689
Straits (Whim Creek) Pty Ltd	Whim Creek	97	108
Teck Cominco WA Pty Ltd	Pillara	36	28
TOTAL BASE METALS		1,112	1,850
COAL			
Griffin Coal Mining Co. Pty Ltd	Muja	317	379
Wesfarmers Coal Ltd	Premier-WCL	365	371
TOTAL COAL		682	750
DIAMONDS			
Argyle Diamond Mines Pty Ltd	Lake Argyle	1,282	1,181
Kimberley Diamond Company Ltd	Ellendale	202	302
TOTAL DIAMONDS		1,484	1,483
GOLD			
Agincourt Resources Limited	Wiluna	245	230
Agnew Gold Mining Company Pty Limited	Emu	929	951
AngloGold Australia Ltd	Sunrise Dam	863	904
Australian Gold Resources Ltd	Perth Mint	125	120
Barmenco Pty Ltd	Lights of Israel	2	0
Barrick Gold of Australia Limited	Darlot	178	213
	Granny Smith	595	414
	Lawlers	262	307
	Plutonic	558	457
BGM Group	Boddington	53	66
Bullabulling Joint Venture	Bullabulling	0	11
Burnakura Joint Venture	Burnakura	32	85
Coolgardie Mining Company Pty Ltd	Coolgardie Group	116	13
Croesus Mining NL	Hannan South	5	2
	Norseman	212	213
Equigold NL	Kirkalocka	94	58
Legend Mining Limited	Gidgee	96	11
Gindalbie Gold NL	Minjar	4	4
Haoma Pty Ltd	Bamboo Creek	9	10
Harmony Gold Mining Company Ltd	New Celebration, Jubilee, New Hampton	300	209
Kalgoorlie Consolidated Gold Mines Pty Ltd	Golden Mile-Super Pit	1,347	1,491
LionOre Australia (Wildara) NL	Thunderbox	195	336
Mercator Gold Australia Pty Ltd	Bluebird Group	21	19

Table 5 Average Number of Persons Employed in the WA Minerals and Petroleum Industries

MINERAL/Company	Operating Site	2004-05	2005-06
Mines and Resources Australia Pty Ltd	Frogs Legs Group	118	43
Monarch Resources Limited	Davyhurst	76	34
Mount Magnet Gold NL	Hill 50-Mt Magnet	395	417
Newcrest Mining Ltd	Telfer	1,868	2,015
Newmont Mining Corporation	Jundee	575	582
	Bronzewing-Mt McClure	11	9
Newfield Central Pty Ltd	Newfield Central	10	2
Nustar Mining Corporation Limited	Paulsens	112	83
Perilya Daisy-Milano Pty Ltd	Daisy-Milano	60	67
Placer Dome Inc	Kanowna Belle	400	101
	Paddington-Mt Pleasant	460	1
	Siberia Group-SMC	37	0
	Kalgoorlie West Group	0	757
Range River Gold Ltd	Indee Group	0	26
Roche Mining (Jr) Pty Ltd	Mount Olympus	0	11
Sipa Resources International NL	Marvel Loch-Yilgarn Star	395	363
St Barbara Mines Ltd	Carosue Dam	269	86
	Sons of Gwalia	60	108
St Ives Gold Mining Company Pty Limited	Kambalda-St Ives	1,340	1,073
Tanami Gold NL	Coyote Group	0	21
Troy Resources Ltd	Sandstone Group	47	81
Other	Various	16	41
TOTAL GOLD		12,490	12,045
HEAVY MINERAL SANDS			
BHP Titanium Minerals Pty Ltd	Beenup	8	8
Cable Sands Pty Ltd	Bunbury	324	203
Doral Mineral Sands Pty Ltd	Dardanup	286	125
GMA Garnet Pty Ltd	Narngulu Garnet Plant	29	31
	Port Gregory-Hutt Lagoon	24	27
Doral Specialty Chemicals Pty Ltd	Rockingham Zirconia Plant	23	20
Iluka Resources Limited	Capel	538	650
	Eneabba	269	380
	Narngulu Synthetic Rutile Plants	480	652
	Gingin-Iluka	28	92
TiWest Pty Ltd	Chandala-Muchea	253	250
	Cooljarloo	360	394
	Bunbury Port	4	20
TOTAL HEAVY MINERAL SANDS		2,626	2,852
IRON ORE			
Aztec Resources Limited	Koolan Island	0	20
BHP Iron Ore (Goldsworthy) Ltd	Finucane Island	277	255
	Yarrie	253	316
BHP Iron Ore (Jimblebar) Ltd	Jimblebar	244	258
BHP Iron Ore Ltd	Mining Area C	286	447
	Mount Newman Railway	486	739
	Mount Whaleback	1,578	1,827
	Nelson Point	704	810
	Orebody 25	173	219
	Port Hedland HBI Plant	639	80
	Yandi	384	610

Table 5 Average Number of Persons Employed in the WA Minerals and Petroleum Industries

MINERAL/Company	Operating Site	2004-05	2005-06
IRON ORE cont.			
Fortescue Metals Group Ltd	Cloud Break	0	12
Hamersley Iron Pty Ltd	Brockman No. 2 Detritals Group	194	276
	Dampier Port Operations	1,408	1,513
	Hismelt-Kwinana	666	283
	Marandoo	206	165
	Nammuldi	9	72
	Paraburdoo-Channar-Eastern Range	682	948
	Paraburdoo Power Plant	0	25
	Tom Price	1,209	1,275
	Yandicoogina	595	747
Henry Walker Eltin Cockatoo Pty Ltd	Cockatoo Island	119	119
MacMahon Holdings Pty Ltd	Mt Newman Ore Body 18-Shovelanna Hill	17	95
Mine and Port Developments Joint Venture	PACE-RGP Group	91	351
Mount Gibson Mining Limited	Tallering Peak	117	210
Pilbara Railway Company	Includes Hamersley and Robe railway operations	452	538
Portman Mining Ltd	Koolyanobbing	290	478
Robe River Mining Co. Pty Ltd	Cape Lambert	771	944
	West Angelas	586	618
	Pannawonica Deepdale	475	415
TOTAL IRON ORE		12,911	14,665
NICKEL			
Australian Mines Limited	Blair	55	41
Australian Nickel Mines NL	Armstrong-Kambalda	27	0
BHP Billiton Minerals Pty Ltd	Ravensthorpe	227	823
BHP Billiton (Nickel West)	Cliffs	5	26
	Kalgoorlie Nickel Smelter	911	1,057
	Kambalda	232	349
	Kwinana Refinery	367	418
	Leinster	1,372	1,307
	Mt Keith	1,166	1,280
Fox Resources Pty Ltd	Radio Hill	85	103
Goldfields Mine Management Pty Ltd	Kambalda Group-GMM	134	129
Kimberley Nickel Mines Pty Ltd	Sally Malay Group	208	210
Lanfranchi Nickel Mines	Lanfranchi	16	75
Lightning Nickel Pty Ltd	Long Nickel	126	132
LionOre Australia (Nickel) Ltd	Bulong	17	13
	Emily Ann	272	332
	Honeymoon Well	376	297
Mincor Operations Pty Ltd	Miitel, Wannaway, Redross, Mariners	268	298
OMG Cawse Pty Ltd	Cawse	199	226
MPI Mines Ltd	Black Swan	255	339
Murrin Murrin Operations Pty Ltd	Murrin Murrin	1,670	1,753
Reliance Operations Ltd	Beta-Hunt Nickel Group	109	164
Sir Samuel Mines NL	Cosmos	115	148
Tectonic Resources NL	Rav 8	69	14
View Resources Ltd	Carnilya Hill-Carnilya East	34	13
Western Areas Limited	Forrestania	33	102
TOTAL NICKEL		8,348	9,649

Table 5 Average Number of Persons Employed in the WA Minerals and Petroleum Industries

MINERAL/Company	Operating Site	2004-05	2005-06
PETROLEUM PRODUCTS			
Apache Energy Ltd	East Spar, Harriet, Stag, Campbell, Chervil, Agincourt-Wonnich, Sinbad, Tanami, North Herald, South Pepper, John Brookes	323	302
ARC Energy NL	Dongara, Erimia, Hovea, Evandra	20	20
BHP Billiton Petroleum (North West Shelf) Pty Ltd	Griffin	89	121
Chevron (Australia) Pty Ltd	Barrow Island, Crest, Roller-Skate, Saladin, Yammaderry	600	770
Empire Oil and Gas	Rough Range	0	8
ENI Australia	Woollybutt	74	89
Kimberley Oil NL	Blina, Boundary, Lloyd, Sundown, West Terrace	3	3
Origin Energy Resources Ltd	Beharra Springs, Tubridgi, Jingemia	23	25
Roc Oil (WA) Pty Ltd	Cliff Head	0	17
Santos Limited	Mutineer-Exeter	0	73
Vermillion Energy	Wandoo	23	28
Woodside Energy Ltd	Athena, Cossack, Echo-Yodel, Goodwyn, Hermes, North Rankin, Wanaea, Legendre	2,803	3,273
TOTAL PETROLEUM PRODUCTS		3,958	4,729
SALT			
Dampier Salt Ltd	Dampier	227	192
	Lake MacLeod	184	166
	Port Hedland	124	179
WA Salt Supply Koolyanobbing Pty Ltd	Lake Deborah	10	11
Onslow Solar Salt Pty Ltd	Onslow	142	200
Shark Bay Salt JV	Useless Loop	74	66
Western Salt Refinery Pty Ltd	Pink Lake	7	7
TOTAL SALT		768	821
TOTAL CLAYS		72	76
TOTAL CONSTRUCTION MATERIALS		324	371
TOTAL DIMENSION STONE		132	121
TOTAL INDUSTRIAL PEGMATITE MINERALS		22	22
TOTAL LIMESTONE-LIMESAND		115	127
TOTAL MANGANESE ORE		308	302
TOTAL PHOSPHATE		135	143
TOTAL SILICA-SILICA SAND		216	172
TOTAL SILVER		32	36
TOTAL TALC		127	118
TOTAL TIN-TANTALUM-LITHIUM		526	540
TOTAL VANADIUM		15	7
TOTAL CHROMITE		51	73
ALL OTHER MATERIALS		65	473
TOTAL		55,225	61,278

SOURCE: AXTAT Reporting System, Resources Safety Division, Department of Consumer and Employment Protection, for minerals data and petroleum producers for petroleum data. Figures are as provided by the various operating companies.

Table 6 Principal Mineral and Petroleum Producers Effective 1 September 2006

BASE METALS

COPPER-LEAD-ZINC

Birla Nifty Pty Ltd

Level 3, 256 Adelaide Terrace
Perth WA 6000
(08) 9366 8800
Nifty
www.adityabirla.com/our_companies/
international_companies/birla_nifty.htm

BHP Billiton (Nickel West)

191 Great Eastern Highway
Belmont WA 6104
(08) 9479 0500
Kambalda
www.bhpbilliton.com

Newcrest Mining Ltd

Level 2, 20 Terrace Road
East Perth WA 6004
(08) 9270 7070
Telfer
www.newcrest.com.au

Magellan Metals Pty Ltd

96 Welshpool Road
Welshpool WA 6106
(08) 9267 7000
Magellan
www.ivernia.com

Oxiana Limited

Level 9, 31 Queen Street
Melbourne Vic 3000
(03) 8623 2200
Golden Grove
www.oxiana.com.au

Straits Resources Limited

Level 1, 35 Ventnor Avenue
West Perth WA 6005
(08) 9480 0500
Mons Cupri
www.straits.com.au

BAUXITE-ALUMINA

ALUMINA

Alcoa World Alumina Australia

181-205 Davy Street
Booragoon WA 6154
(08) 9316 5111
Del Park, Willowdale, Huntly
www.alcoa.com.au

Worsley Alumina Pty Ltd

PO Box 344
Collie WA 6225
(08) 9734 8311
Boddington
www.wapl.com.au

CHROMITE

CHROMITE ORE

Pilbara Chromite Pty Ltd

28 Ventnor Ave
West Perth WA 6005
(08) 9321 3633
Coobina
www.consminerals.com.au

CLAY

ATTAPULGITE

Hudson Resources Ltd
2 Kemp Street, Narngulu
Geraldton WA 6530
(08) 9923 3604
Lake Nerramyne
www.hudsonresources.com

CLAY SHALE

The Griffin Coal Mining Company Pty Limited

28 The Esplanade
Perth WA 6000
(08) 9261 2800
Collie
www.griffincoal.com.au

FIRE CLAY

Midland Brick Company Pty Ltd

102 Great Northern Highway
Middle Swan WA 6056
(08) 9273 5522
Bullsbrook North
www.midlandbrick.com.au

KAOLIN

Sons of Gwalia Ltd

Level 3, 30 The Esplanade
Perth WA 6000
(08) 9263 5555
Greenbushes
www.sog.com.au

SAPONITE

Watheroo Minerals Pty Ltd

PO Box 353
Dunsborough, WA 6281
(08) 9756 6121
Watheroo Clays
www.bentoniteproductswa.com.au

COAL

The Griffin Coal Mining Company Pty Limited

28 The Esplanade
Perth WA 6000
(08) 9261 2800
Collie
www.griffincoal.com.au

Wesfarmers Premier Coal Ltd

Premier Road
Collie WA 6225
(08) 9780 2222
Collie
www.wesfarmers.com.au

CONSTRUCTION MATERIALS

AGGREGATE

The Readymix Group (WA)

Technology Park
18-20 Brodie Hall Drive
Bentley WA 6102
(08) 9212 2000
Boodarie, Burrup-Dampier
www.readymix.com.au

GRAVEL

Boral Resources (WA) Ltd

63-69 Abernethy Road
Belmont WA 6104
(08) 9333 3400
Grosmont
www.boral.com.au

WA Limestone Co.

41 Spearwood Avenue
Bibra Lake WA 6163
(08) 9434 2299
Pickering Brook

SAND

Boral Resources (WA) Ltd

63-69 Abernethy Road
Belmont WA 6104
(08) 9333 3400
Grosmont
www.boral.com.au

Rocla Quarry Products

130 Fauntleroy Avenue
Redcliffe WA 6104
(08) 9475 2555
Gnangarra
www.rocla.com.au

The Readymix Group (WA)

Technology Park
18-20 Brodie Hall Drive
Bentley WA 6102
(08) 9212 2000
Various sites
www.readymix.com.au

Tuma Holdings Pty Ltd

T/as Action Sand Supplies
42 Noel Road
Gooseberry Hill WA 6076
(08) 9275 1100
Mobile: 0408 923 801
The Lakes, Mundaring

DIAMONDS

Argyle Diamonds Australia

2 Kings Park Road
West Perth WA 6005
(08) 9482 1166
Argyle
www.argylediamonds.com.au

Kimberley Diamond Company

12 Walker Avenue
West Perth WA 6005
(08) 9321 5887
Ellendale
www.kimberleydiamondco.com.au

DIMENSION STONE

GRANITE

Fraser Range Granite NL

Eyre Highway
Norseman WA 6443
(08) 9039 3442
Fraser Range Granite

Table 6 Principal Mineral and Petroleum Producers Effective 1 September 2006

FELDSPAR

Unimin Australia Ltd

26-28 Tomlinson Road
Welshpool WA 6106
(08) 9362 1655
Pippingarra, Mukinbudin
www.unimin.com.au

GOLD

Agincourt Resources Limited

1st Floor, 16 Ord Street
West Perth WA 6005
(08) 9216 5800
Wiluna, Lake Way Gold
www.agincourtresources.com.au

Agnew Gold Mining Co Pty Ltd

PMB 10
Leinster WA 6437
(08) 9088 3822
Agnew
www.goldfields.co.za

AngloGold Australia Ltd

Level 13, St Martin's Tower
44 St Georges Terrace
Perth WA 6000
(08) 9425 4600
Sunrise Dam
www.anglogold.com

Barrick Gold of Australia Limited

Level 10, 2 Mill Street
Perth WA 6000
(08) 9212 5777
Darlot, Lawlers, Plutonic, Granny Smith,
Kanowna Belle, Golden Feather,
Kundana, Paddington
www.barrick.com

Croesus Mining NL

39 Porter Street
Kalgoorlie WA 6430
(08) 9091 2222
Central Norseman
www.croesus.com.au

Equigold NL

1st Floor, 7 Sleat Road
Applecross WA 6153
(08) 9316 3661
Kirkalocka
www.equigold.com.au

Extract Resources Limited

Ground Floor, 47 Kishorn Road
Applecross WA 6153
(08) 9316 1214
Burnakura
www.extres.com.au

Harmony Gold (Australia) Pty Ltd

Level 1, 10 Ord Street
West Perth WA 6005
(08) 9211 3100
Hill 50-Mt Magnet,
South Kal Mines-New Celebration,
www.harmony.co.za

Kalgoorlie Consolidated Gold Mines Pty Ltd

Private Bag 27
Kalgoorlie WA 6433
(08) 9022 1100
Golden Mile
www.kalgold.com.au

LionOre Australia Pty Ltd

PO Box 205
Leinster WA 6437
(08) 9088 3400
Thunderbox
www.lionore.com

Mines and Resources Australia Pty Ltd

Level 1, 12 St Georges Terrace
Perth WA 6000
(08) 9202 1100
Mungari East-Frogs Legs
www.cogema.com

Monarch Gold Mining Company Limited

Level 1, 23 Ventnor Avenue
West Perth WA 6005
(08) 9481 6422
Davyhurst,
www.mrl.net.au

Newcrest Mining Ltd

Level 2, 20 Terrace Road
East Perth WA 6004
(08) 9270 7070
Telfer
www.newcrest.com.au

Newfield Central Pty Ltd

PO Box 1094
Kalgoorlie WA 6430
(08) 9021 7234
Mobile: 041 999 1713
Newfield Central

Newmont Australia

PO Box 1652
Subiaco WA 6904
(08) 9983 7000 (site)
Jundee-Nimary
www.newmont.com

Nustar Mining Corporation Limited

Level 2, 34 Colin Street
West Perth WA 6005
(08) 9346 0000
Paulsens
www.nustarmining.com.au

Perilya Daisy-Milano Pty Ltd

PO Box 675
Kalgoorlie WA 6433
(08) 9024 2222
Mt Monger-Ridgeview, Daisy Milano
www.perilya.com.au

Saracen Mineral Holdings Limited

Level 7, 350 Collins Street
Melbourne Vic 3000
(03) 9670 0040
Carosue Dam

St Barbara Mines Ltd

1205 Hay Street
West Perth WA 6005
(08) 9476 5555
Cornishman,
Marvel Loch-Southern Cross,
www.stbarbara.com.au

St Ives Gold Mining Co Pty Ltd

POB 359
Kambalda WA 6442
(08) 9088 1111
Kambalda-St Ives
www.goldfields.co.za

Troy Resources NL

44 Ord Street
West Perth WA 6005
(08) 9481 1277
Sandstone
www.try.com.au

Yilgarn Mining Ltd

Suite 3, 9 Bowman Street
South Perth WA 6151
(08) 9474 3911
Rose Dam
www.yilgarnmining.com.au

GYPSUM

Cockburn Cement Ltd

Lot 242 Russell Road East
East Munster WA 6166
(08) 9411 1000
Lake Hillman

CSR Limited

21 Sheffield Road
Welshpool WA 6106
(08) 9365 1666
Jurien Bay North

Dampier Salt Pty Ltd

37 Belmont Avenue
Belmont WA 6104
(08) 9270 9270
Lake MacLeod
www.dampiersalt.com.au

Gypsum Industries

PO Box 952
Canning Bridge WA 6153
(08) 9364 4951
Lake Cowcowing
www.aglime.com.au

Lake Hillman Mining Pty Ltd

PO Box 1
Kalannie WA 6468
(08) 9666 2045
Lake Hillman

HEAVY MINERAL SANDS

GARNET SAND

GMA Garnet Pty Ltd

PO Box 188
Geraldton WA 6531
(08) 9923 3644
Port Gregory
www.garnetsales.com

Table 6 Principal Mineral and Petroleum Producers Effective 1 September 2006

**ILMENITE, LEUCOXENE,
RUTILE AND ZIRCON**

Cable Sands (WA) Pty Ltd

PO Box 133
Bunbury WA 6231
(08) 9721 0200
Jangardup, Sandalwood,
Ludlow, Tutunup
www.cablesands.com.au

Doral Mineral Sands

Lot 7 Harris Road
Picton WA 6229
(08) 9725 4899
www.doral.com.au

Iluka Resources Ltd

Level 23, 140 St Georges Terrace
Perth WA 6000
(08) 9360 4700
Capel, Eneabba, Yoganup
www.iluka.com

TiWest Pty Ltd

1 Brodie Hall Drive
Bentley WA 6102
(08) 9365 1333
Cooljarloo
www.tiwest.com.au

IRON ORE

BHP Billiton Iron Ore (Goldsworthy) Ltd

225 St Georges Terrace
Perth WA 6000
(08) 9320 4444
Mining Area C, Nimingarra–Yarrie
www.bhpbilliton.com

BHP Billiton Iron Ore Ltd

225 St Georges Terrace
Perth WA 6000
(08) 9320 4444
Jimblebar, Newman, Yandicoogina
www.bhpbilliton.com

Channar Mining Pty Ltd

152 St Georges Terrace
Perth WA 6000
(08) 9327 2327
Channar

Hamersley Iron Pty Ltd

152 St Georges Terrace
Perth WA 6000
(08) 9327 2327
Brockman, Marandoo, Paraburdo, Tom Price, Yandicoogina
www.hamersleyiron.com

Mt Gibson Iron Limited

1st Floor, 7 Havelock Street
West Perth WA 6005
(08) 9426 7500
Tallering Peak
www.mtgibsoniron.com.au

Portman Iron Ore Ltd

Level 11, 1 William Street
Perth WA 6000
(08) 9426 3333
Cockatoo Island, Koolyanobbing
www.portman.com.au

Robe River Iron Associates

Level 27 Central Park
152-158 St Georges Terrace
Perth WA 6000
(08) 9327 2800
Pannawonica, West Angelas
www.roberiver.com.au

LIMESAND–LIMESTONE

Cockburn Cement Ltd

Lot 242 Russell Road East
East Munster WA 6163
(08) 9411 1000
Cockburn, Dongara, Wanneroo
www.cockburncement.com.au

Limestone Resources Australia Pty Ltd

Unit 1, 7 Guthrie Street
Osborne Park WA 6017
(08) 9445 3433
Wanneroo, Moore River, Carabooda
www.limestone-resources.com.au

Loongana Lime Pty Ltd

PO Box 808
Kalgoorlie WA 6430
(08) 9021 8055
Loongana

WA Limestone Co.

41 Spearwood Avenue
Bibra Lake WA 6163
(08) 9434 2299
Postans

Gypsum Industries of Australia

PO Box 952
Canning Bridge WA 6153
(08) 9364 4951
Dongara–Denison, Cervantes,
Lancelin, Jurien

MANGANESE

Pilbara Manganese Pty Ltd

28 Ventor Avenue
West Perth WA 6005
(08) 9321 3633
Woodie Woodie
www.consminerals.com.au

NICKEL

Australian Mines Limited

Level 1, 681 Murray Street
West Perth WA 6005
(08) 9481 5811
Blair
www.australianmines.com.au

Consolidated Minerals Limited

28 Ventnor Avenue
West Perth WA 6005
(08) 9321 3633
Beta Hunt
www.consminerals.com.au

Fox Resources Ltd

Suite 1 and 2, 614 Newcastle Street
Leederville WA 6007
(08) 9318 5600
Radio Hill
www.foxresources.com.au

Minara Resources Ltd

Level 4, 30 The Esplanade
Perth WA 6000
(08) 9212 8400
Murrin Murrin
www.minara.com.au

Independence Group NL

PO Box 893
South Perth WA 6951
(08) 9367 2755
Long Nickel
www.independencegroup.com.au

LionOre (Australia) Pty Ltd

Level 3, 88 Colin Street
West Perth WA 6005
(08) 9426 0100
Black Swan, Emily Ann
www.lionore.com

Mincor Resources NL

Level 1, 1 Havelock Street
West Perth WA 6005
(08) 9321 7125
Miitel, Wannaway, Redross
www.mincor.com.au

OMG Cawse Pty Ltd

Cawse Nickel Operations
Locked Bag 32
Kalgoorlie WA 6433
(08) 9024 8800
Cawse
www.omgi.com

Sally Malay Mining Ltd

Level 22 Allendale Square
77 St Georges Terrace
Perth WA 6000
(08) 9225 0999
Sally Malay, Lanfranchi Tramways
www.sallymalay.com

Sir Samuel Mines NL

3rd Floor, 24 Outram Street
West Perth WA 6005
(08) 9213 1588
Cosmos
www.jubileemines.com.au

Tectonic Resources NL

Suite 4, 100 Hay Street
Subiaco WA 6008
(08) 9388 3872
RAV8
www.tectonicres.com.au

View Resources Ltd

Level 12 London House
216 St Georges Terrace
Perth WA 6000
(08) 9226 4611
Carnilya Hill
www.viewresources.com.au

BHP Billiton (Nickel West)

191 Great Eastern Highway
Belmont WA 6104
(08) 9479 0500
Kambalda, Leinster, Mt Keith
www.bhpbilliton.com

Table 6 Principal Mineral and Petroleum Producers Effective 1 September 2006

PALLADIUM

BHP Billiton (Nickel West)

191 Great Eastern Highway
Belmont WA 6104
(08) 9479 0500
Kambalda
www.bhpbilliton.com

PETROLEUM

Apache Energy Ltd

Level 3, 256 St Georges Terrace
Perth WA 6000
(08) 9422 7222

Agincourt, Campbell, Double Island, East Spar, Endymion, Gibson, Gipsy, Harriet, Hoover, Little Sandy, North Gipsy, North Pedirka, Pedirka, Rosette, Simpson, Sinbad, South Plato, Stag, Tanami, Victoria, Wonnich
www.apachecorp.com

ARC Energy Ltd

Level 4, 679 Murray Street
West Perth WA 6005
(08) 9486 7333

Dongara, Hovea-Erechia, Woodada, Mt Horner, Xyris
www.arcenergy.com.au

BHP Billiton Petroleum (North West Shelf) Pty Ltd

Level 42 Central Park
152-158 St Georges Terrace
Perth WA 6000
(08) 9278 4888
Chinook-Scindian, Griffin
www.bhpbilliton.com

ChevronTexaco Australia Pty Ltd

Level 24 QV1 Building
250 St Georges Terrace
Perth WA 6000
(08) 9216 4000
Barrow Island, Cowle, Crest, Roller-Skate, Saladin, Yammaderry
www.chevron.com

ENI Australia Limited

Level 3, 40 Kings Park Road
West Perth WA 6005
(08) 9320 1111
Woollybutt

Kimberley Oil NL

Suite 12B, 573 Canning Highway
Alfred Cove WA 6154
(08) 9330 8876
Blina
www.kimberleyoil.com.au

Vermillion Oil & Gas Pty Ltd

Level 7, 30 The Esplanade
Perth WA 6000
(08) 9480 0300
Wandoo
www.vermillionenergy.com

Origin Energy Resources Ltd

34 Collins Street
West Perth WA 6005
(09) 9324 6111
Beharra Springs, Jingemla, Tarantula
www.originenergy.com.au

Santos Limited

Level 29 Santos House
91 King William Street
Adelaide SA 5000
(08) 8218 5111
Mutineer-Exeter
www.santos.com.au

Vermillion Energy

Level 7 BNZ House
30 The Esplanade
Perth WA 6000
(08) 480 0300
Wandoo
www.vermillionenergy.com.au

Woodside Energy Ltd

240 St Georges Terrace
Perth WA 6000
(08) 9348 4000
Athena, Cossack, Echo-Yodel, Goodwyn, Hermes, Lambert, Laminaria, Legendre, North Rankin, Perseus, Wanaea
www.woodside.com.au

PLATINUM

BHP Billiton (Nickel West)

191 Great Eastern Highway
Belmont WA 6104
(08) 9479 0500
Kambalda
www.bhpbilliton.com

SALT

Dampier Salt Pty Ltd

37 Belmont Avenue
Belmont WA 6104
(08) 9270 9270
Dampier, Lake MacLeod, Port Hedland
www.dampiersalt.com.au

Onslow Salt Pty Ltd

PO Box 23
Onslow WA 6710
(08) 9184 9000
Onslow Salt
www.onslowsalt.com

Shark Bay Salt Joint Venture

Level 16, 2 The Esplanade
Perth WA 6000
(08) 9265 8000
Useless Loop

WA Salt Supply Ltd

Cockburn Road
Hamilton Hill WA 6163
(08) 9430 5495
Lake Deborah East, Pink Lake
www.wasalt.com.au

SILICA-SILICA SAND

SILICA

Simcoa Operations Pty Ltd

PO Box 1389
Bunbury WA 6231
(08) 9780 6666
Dalaroo
www.simcoa.com.au

SILICA SAND

Rocla Quarry Products

180 Fauntleroy Avenue
Kewdale WA 6105
(08) 9475 2555
Gnangarra
www.rocla.com.au

Austsand Pty Ltd

PO Box 1373
Albany WA 6330
(08) 9846 1288
Mindijup

SPONGOLITE

Supersorb Minerals NL

30 Graham Street
Albany WA 6330
(08) 9842 1955
Woogenellup
www.supersorb.com.au

TALC

Luzenac Australia Pty Ltd

Level 22 Central Park
152-158 St Georges Terrace
Perth WA 6000
(08) 9327 2277
Three Springs
www.luzenac.com

Unimin Australia Ltd

26 Tomlinson Road
Welshpool WA 6106
(08) 9362 1655
Mt Seabrook
www.unimin.com.au

TIN-TANTALUM-LITHIUM

SPODUMENE

Sons of Gwalia Ltd

Level 3, 30 The Esplanade
Perth WA 6000
(08) 9263 5555
Greenbushes, Wodgina
www.sog.com.au

TANTALITE-TIN

Sons of Gwalia Ltd

Level 3, 30 The Esplanade
Perth WA 6000
(08) 9263 5555
Greenbushes, Wodgina,
www.sog.com.au

Haddington Resources Ltd

7 Havelock Street
West Perth WA 6005
(08) 9226 5100
Bald Hill
www.haddington.com.au

Abbreviations

A\$	Australian Dollar	km	kilometres
ABARE	Australian Bureau of Agricultural and Resource Economics	km ²	square kilometres
ABS	Australian Bureau of Statistics	LME	London Metal Exchange
AFR	Australian Financial Review	Mbbl	thousand barrels of oil
ANZ	Australia and New Zealand bank	MMbbl	million barrels of oil
bbl	barrels of oil	Mct	million carats
Bcm	billion cubic metres	Moz	million ounces
BMR	Bureau of Mineral Resources	Mt	million tonnes
cons	concentrates	Mt/a	million tonnes per annum
CSO	Central Selling Organisation	n/a	not applicable
ct	carat	oz	ounce
DRI	Direct Reduced Iron	RBA	Reserve Bank of Australia
ECB	European Central Bank	SARS	Severe Acute Respiratory Syndrome
f.o.b.	free-on-board	t	tonnes
f.o.t.	free-on-truck	t/a	tonnes per annum
GDP	Gross Domestic Product	Tcf	trillion cubic feet
HBI	Hot Briquetted Iron	US\$	United States Dollar
IMF	International Monetary Fund	WTI	West Texas Intermediate

Units and Conversion Factors

	Metric Unit	Symbol	Imperial Unit
Mass	1 gram	g	= 0.032151 troy (fine) ounce (oz)
	1 kilogram	kg	= 2.204624 pounds (lb)
	1 tonne	t	= 1.10231 United States short ton [1 US short ton = 2,000 lb]
	1 tonne	t	= 0.98421 United Kingdom long ton [1 UK long ton = 2,240 lb]
	1 tonne LNG	t	= 52,000,000 British Thermal Units (Btu)
Volume	1 kilolitre	kl	= 6.28981 barrels (bbl)
	1 cubic metre	m ³	= 35.3147 cubic feet (ft ³) [1 kilolitre (kl) = 1 cubic metre (m ³)]
Energy	1 kilojoule	kj	= 0.94781 British Thermal Units (Btu)
	Energy Content	Prefix	
Coal	19.7 GJ/t	kilo (k)	10 ³
Condensate	32.0 MJ/L	mega (M)	10 ⁶
Crude oil	37.0 MJ/L	giga (G)	10 ⁹
LNG	25.0 MJ/L	tera (T)	10 ¹²
Natural gas	38.2 MJ/m ³	peta (P)	10 ¹⁵
LPG-butane	28.7 MJ/L (1tonne LPG-butane = 1,720 litres)		
LPG-propane	25.4 MJ/L (1tonne LPG-propane = 1,960 litres)		

Data Sources

Quantities and values for minerals and petroleum in this publication are collected from a variety of sources including:

The Department's royalty returns, various company annual reports and quarterly Australian Stock Exchange reports, State port authority statistics, the ABS and ABARE.

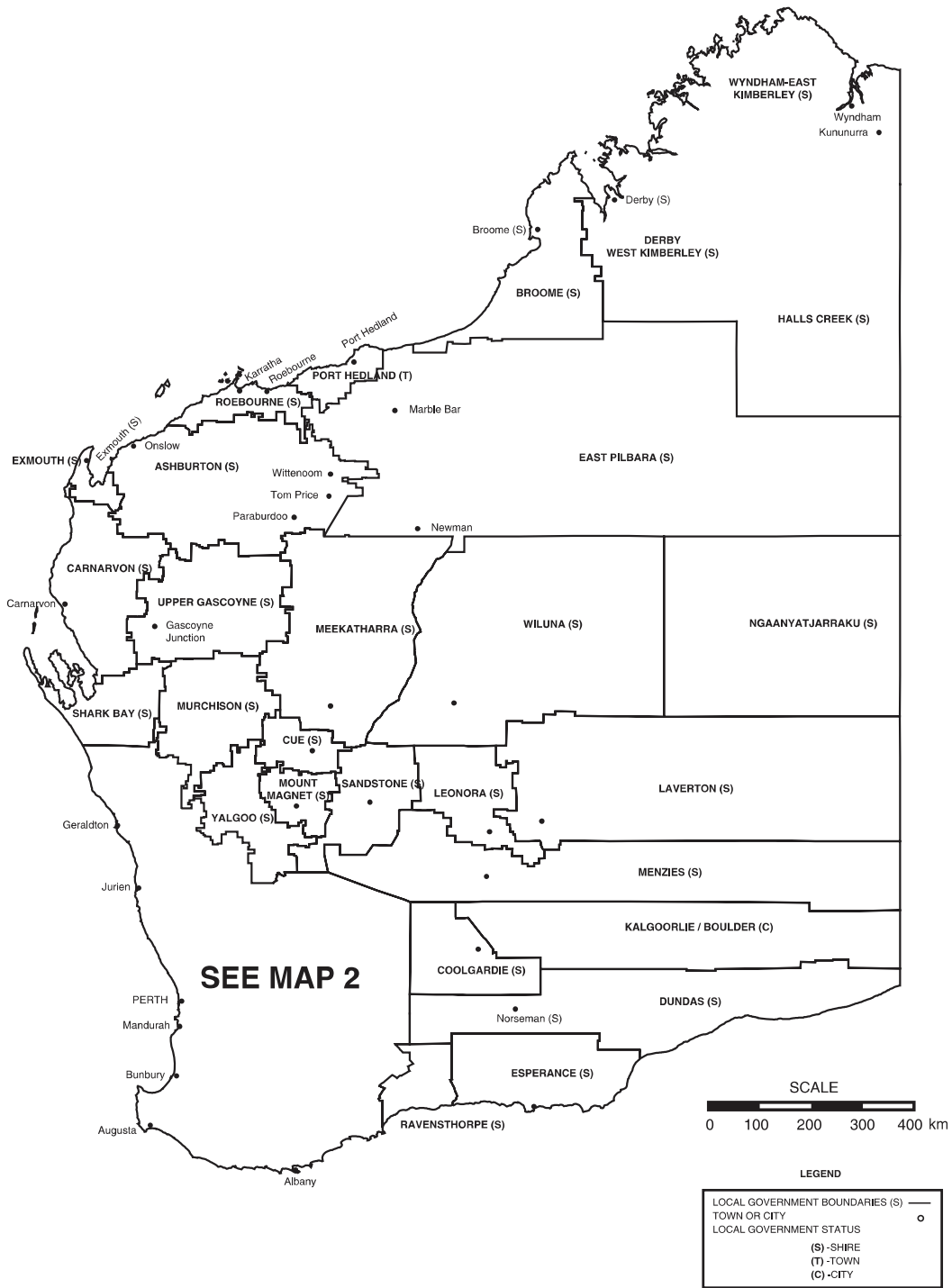
Quantities specified relate to either mine production or sales as listed below for each commodity.

Mine Production
Clays
Coal
Construction Materials
Dimension Stone
Gold
Gypsum
Limesand–Limestone–Dolomite
Silica–Silica Sand
Talc
Sales
Alumina
Base Metals (Copper, Lead and Zinc)
Chromite
Diamonds
Gem and Semi-Precious Stones
Heavy Mineral Sands
Industrial Pegmatite Minerals
Iron Ore
Manganese
Nickel Industry (Nickel, Cobalt, Platinum and Palladium)
Petroleum
Pigments
Salt
Silver
Spongolite
Tin–Tantalum–Lithium
Vanadium

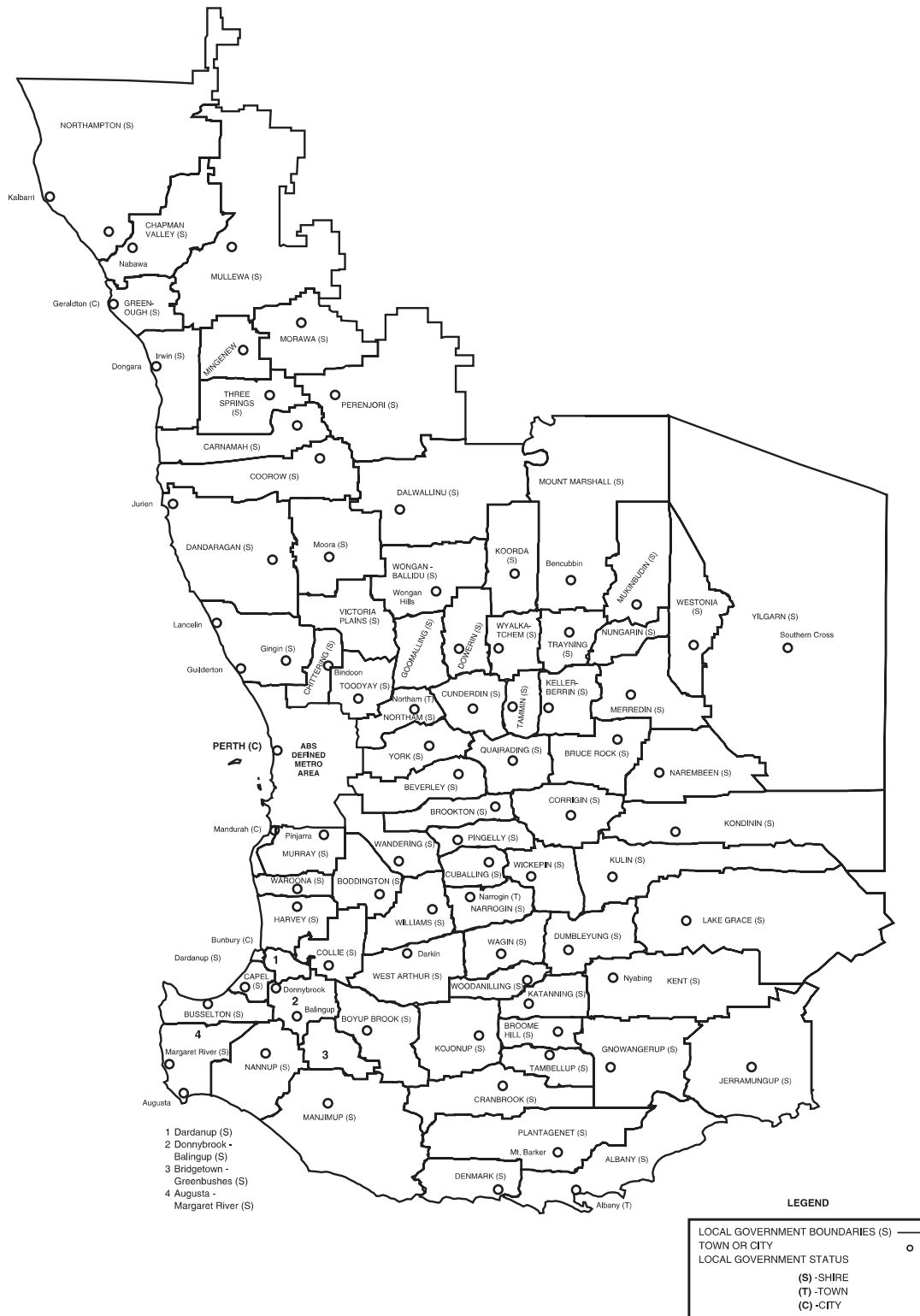
Classification of Countries

Euro area ¹ / European Union	
<i>Austria</i>	<i>Italy</i>
<i>Belgium</i>	Latvia
Cyprus	Lithuania
Czech Republic	<i>Luxembourg</i>
Denmark	Malta
Estonia	<i>Netherlands</i>
<i>Finland</i>	Poland
<i>France</i>	<i>Portugal</i>
<i>Germany</i>	Slovakia
<i>Greece</i>	Slovenia
Hungary	<i>Spain</i>
<i>Ireland</i>	Sweden
	United Kingdom
Non-Japan Asia	
Afghanistan	Myanmar
Bangladesh	Nepal
Bhutan	Newly industrialised Asia
Brunei Darussalam	Pakistan
Cambodia	Papua New Guinea
China	Philippines
Fiji	Samoa
India	Solomon Islands
Indonesia	Sri Lanka
Kiribati	Thailand
Lao PD Republic	Tonga
Malaysia	Vanuatu
Maldives	Vietnam
Mongolia	
Newly Industrialised Asia	
Hong Kong	Singapore
Republic of Korea	Taiwan

¹Italics indicate countries that are members of the euro area.

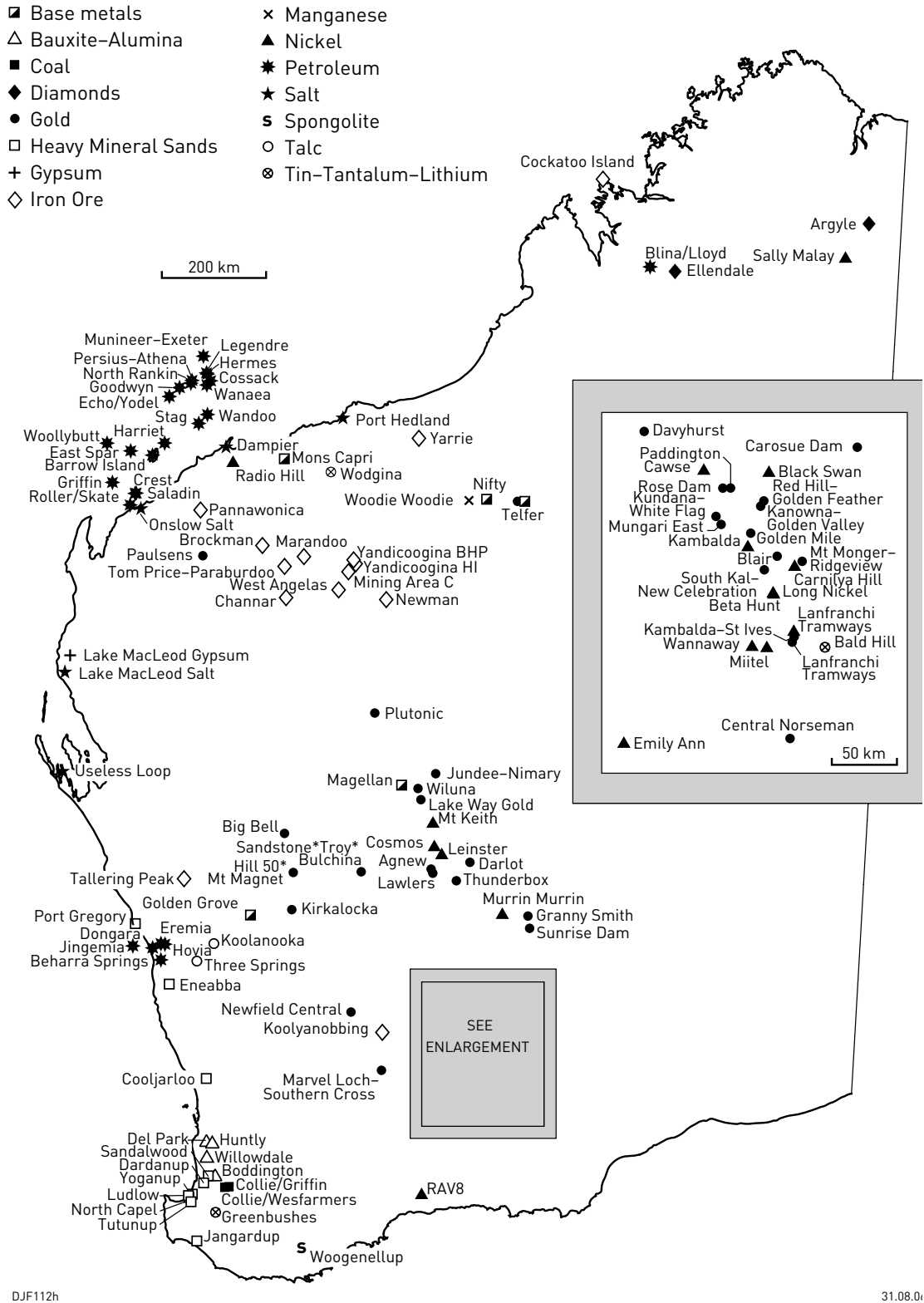


Map 1 Local Government Boundaries



Map 2 Local Government Boundaries

- 1 Dardanup (S)
- 2 Donnybrook - Balingup (S)
- 3 Bridgetown - Greenbushes (S)
- 4 Augusta - Margaret River (S)



Map 3 Major Mineral and Petroleum Projects in Western Australia

This publication is available on our website

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