

Western Australia

Statistics Digest

Mineral and Petroleum Production



1999-00



DEPARTMENT OF
MINERALS AND ENERGY
WESTERN AUSTRALIA

"Our Resources • Our People • Our Future"



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FOREWORD



L C Ranford
DIRECTOR GENERAL

A handwritten signature in cursive script that reads "Lee Ranford".

Welcome to the Department of Minerals and Energy's 1999-00 Statistics Digest. This publication contains the most comprehensive statistical information available on the Western Australian resource industry.

The statistics in this Digest show that in 1999-00 the State's minerals and energy sector set a new record, with the value of sales rising by nearly 28% to around \$21.3 billion. This compares with a decade average annual growth rate of 6.4%.

Whilst most of the State's minerals and energy industries recorded growth in sales quantities, the overall rise in production value for 1999-00 is mainly attributed to a general and sustained improvement in commodity prices in addition to better than anticipated results for the petroleum sector. The 1999-00 outcomes for petroleum are impressive and they further entrench its position as the State's leading resource industry.

The mineral and petroleum sectors continue to remain the pillar of the State's economy accounting for around 30% of Gross State Product, around 70% of its export income and around one-sixth, both direct and indirect, of its employment.

With the new millennium approaching it is worthwhile to examine the growth prospects of the State's resource sector. Overall, it is anticipated that Western Australia will be able to maintain its prominence on the international minerals scene well into the 21st century. Focusing on short-term prospects, favourable world economic growth conditions are expected for the remainder of 2000 and 2001 and this, when combined with a tightening of most commodities markets, should see the recent gains in commodity prices maintained over these years.

To maintain Western Australia's position as one of the world's prominent players in international mineral markets it is important that the State continues to build on its existing advantages. The State's push for further deregulation of the energy sector, as well as its efforts towards improving the infrastructure base, augurs well for the mining industry taking up downstream processing opportunities. It is also important that, where possible, the State continues its endeavours to reduce uncertainties in the local operating environment. Native title issues continue to be of major concern to industry and these and other issues are discussed in the Digest.

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 the Digest.

1. ECONOMIC AND SOCIAL ENVIRONMENT

1.1 Economy Review

1.1.1 World Economy

Throughout 1999-00 world economic conditions progressively improved and this increased the State's export performance.

With merchandise exports accounting for around 40% of Western Australia's economy - as compared to 15% for Australia - the State's growth prospects are more reliant on world economic conditions than for Australia generally.

Since June 1999 world economic conditions have continually improved, and this has over 1999-00 manifested itself into solid export growth in Western Australia. The State's trade surplus, at \$16 billion in 1999-00, grew by 25% over the year and contrasts with a trade deficit of \$12.8 billion for Australia as a whole. Around two-thirds of the State's exports are from the mineral and petroleum sector, with about 70% of these going to Asia.

World economic growth forecast to be strong in 2000 and 2001.

Conditions in the world economy, including those in Western Australia's major trading partners, are expected to remain strong over 2000 and 2001. Economic activity in Japan is expected to continue to improve, albeit at a moderate rate. The USA economy will remain strong and a pick-up in economic activity in East Asia and Europe is also expected.

Following growth of 3.3% in 1999 the IMF (May 2000) expects the world economy to grow by 4.2% in 2000 and 3.9% in 2001. Nonetheless, the rise in world economic activity, in addition to continuing high oil prices, have exacerbated inflationary pressures and this has led to a number of the world's central banks increasing their interest rates over 1999-00. Official interest rates have increased in the order of 1-2 percentage points in virtually all developed countries over the year.

The USA continues to drive world economic growth.

With the USA accounting for around 25% of the world's consumption, developments in the USA economy are central to the overall growth prospects of the world's economy.

In the USA, 1999-00 capped off nine years of solid growth with the economy growing by 5.2%. Nonetheless, the IMF is concerned that this growth is unsustainable and could lead to that economy faltering. To alleviate such concerns, over 1999-00 the Federal Reserve raised interest rates by 1.75 basis points. The latest economic data (September 2000) suggest that the rise in rates has moderated growth to a more sustainable growth trajectory. The consensus forecast is for the economy to grow by 4.9% in 2000 and by 3.1% in 2001.

(NOTE: The consensus forecast refers to GDP forecasts provided by world economists to a survey conducted by The Economist and appearing in its 2nd September 2000 edition.)

Japan's economy is showing tentative signs of recovery.

The Japanese economy rebounded in the second half of 1999-00 and this led to moderate growth of 0.6% being recorded for that year. Growth in industrial production, which provides an indication of the export potential to that economy, has been very strong with growth of 4.1% being recorded over the year to May 2000.

Japan's economy is expected to continue to recover at a modest pace. The consensus forecast is for the economy to grow by 1.7% in 2000 and by 2% in 2001.

Euro area economy grows strongly in 1999-00.

The Euro area refers to eleven countries that are directly participating in the European Monetary Union (i.e. Germany, France, Spain, Portugal, Italy, Austria, Finland, Ireland, the Netherlands, Belgium and Luxembourg). Over 1999-00, economic conditions in the Euro area strengthened with overall growth of 3.2%.

The consensus forecast for the Euro area is for growth of 3.5% in 2000 and 3.1% for 2001.

Non-Japan Asia experiencing strong growth.

Economic growth in the East Asian region continues to exceed expectations and forecasters have become increasingly optimistic about growth in the region.

Following growth of 7.1% in 1999, China, the largest economy in the East Asian region, is expected to record growth of around 7.5% in 2000 and 2001. The South Korean economy, which grew by 10.7% in 1999, is anticipated to remain relatively robust in 2000 and 2001 with growth expected at around 7% for each of these years.

Taiwan's economy is expected to grow by around 6.5% in both 2000 and 2001, and this is slightly higher than the 1999 outcome of 5.7% growth. Hong Kong, Malaysia, Philippines, and Singapore are also expected to record favourable growth for 2000 and 2001.

1.1.2 Australian Economy

Australian economy grew strongly in 1999-00.

The Australian economy grew by 4.4% over 1999-00, with the outcome slightly higher than the Commonwealth's original Budget estimate of 4.25%. Growth was largely driven by private and public consumption, and business and dwelling investments.

Inflation steady in 1999-00 but the outlook for inflation and hence interest rates uncertain.

Australia's inflation rate has continued to remain within the Reserve Bank's 2-3% annual inflation target. In 1999-00 inflation grew by 2.4%, up from 1.3% in 1998-99. Increases in oil and housing prices were the major factors behind the higher 1999-00 inflation outcome.

Concerns over the strength of the Australian economy, in addition to the impact on the CPI of higher world oil prices, plus the widening interest rate differentials between Australia and the USA, saw the Reserve Bank of Australia raise interest rates by 1.5 basis points over 1999-00. Nonetheless, market analysts speculated that rates were largely lifted in 1999-00 so as to curtail the likely future inflationary impact of the 10% Goods and Services Tax, which came into effect on 1 July 2000.

In 1999-00 the A\$ appreciated marginally, but overall Australia's competitive position, as measured by the Trade Weighted Index, improved slightly over the year.

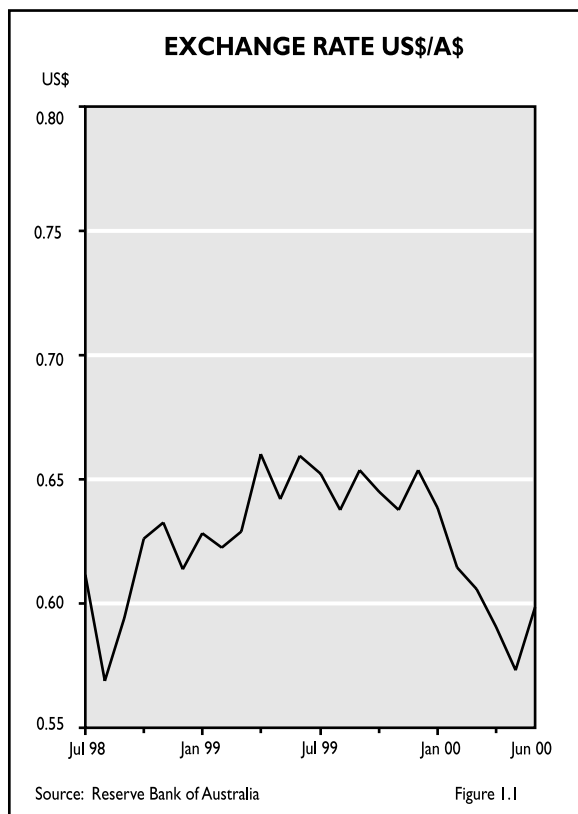
Since June 2000 the A\$ has depreciated considerably reaching an all time low of around 54 US cents in mid-September 2000. It remains unclear as to why the A\$ has come under increased selling pressure. However, if the A\$ remains at around its historical low over the next six months there will be increased pressure on the Reserve Bank to raise interest rates. This action, though a last resort, would not only support the A\$ but also reduce the inflationary pressures arising from a lower A\$.

1.1.3 Western Australian Economy

State domestic economy improving but overall GSP growth will be aided by the significant growth in exports.

In 1999-00 the State's domestic economy grew by 2.1%, the lowest of all States. Growth was largely driven by private and public consumption, and dwelling and public investment. Reflecting the lumpiness of business investment decisions, highlighted over the year by the commissioning of a large number of resource projects, business investment fell by 15% over 1999-00.

While the 1999-00 domestic economy outcome is slightly below the State Budget estimate of 2.75%, it is a substantial increase on growth of 1.1% in the year to March 2000 and 0.9% over 1999. Overall, State growth should be aided by the strong increase in the State's trade surplus in 1999-00, which came about through better than expected export growth. As a result it is expected that the Budget estimate of 4% GSP growth for 1999-00 will be attained.



1.2 Economic Factors Affecting the Mining Industry

World commodity prices improve markedly over 1999-00.

Following poor economic conditions in 1998-99, the resurgence of the world's economy was of obvious relief to the State's mining industry in 1999-00. Throughout 1999-00 world economic conditions progressively improved and this was the underlying catalyst for higher commodity prices and profit outcomes for the industry over that year.

A\$ appreciates marginally in 1999-00.

In terms of price the most notable performers in world commodity markets have been oil and nickel. The recent and sustained recovery in oil prices has been remarkable, with prices rising from a low of US\$9.50 in early February 1999 to a peak of US\$31.74 per barrel in late June 2000. In 1999-00 nickel prices rose by 83% to US\$8,257 per tonne.

Positive outlook for the State's mineral and petroleum sector.

The gains derived by the mining industry through higher commodity prices were not reduced by adverse movements in the A\$ over 1999-00. Given the strength of the Australian economy, higher commodity prices and an improved export performance it was surprising that the A\$ only appreciated marginally over that year. This result was to the benefit of exporters as they were able to reap almost the full A\$ benefits of much higher US\$ commodity prices.

In 1999-00 the value of the State's mineral and petroleum exports was \$18.3 billion. This outcome constitutes about 85% (by value) of the industry's total sales for that year. The most important trading partners were Japan, which received 29% of Western Australia's mineral and petroleum exports, followed by China (10%), the United States of America (10%), South Korea (9%) and Singapore (9%).

The outlook for the State's mineral and petroleum industry is bright. Favourable world economic growth conditions are expected in 2000 and 2001 and this, when combined with a tightening of most commodities markets, should see the recent gains in commodity prices maintained over this period.

An expected lower A\$ for 2000-01 should see further improvements to mining and petroleum profitability levels. However, the risk of a lower A\$, if indeed it remains at its mid-September 2000 historical low, is that it could lead to higher interest rates. Further hikes in rates could adversely impact on the future development and expansion plans of the industry.

Mining industry expected to benefit from the Goods and Services Tax but may lose through changes to accelerated depreciation.

The Commonwealth Government's GST Package (comprising a 10% GST, lower personal income tax rates, abolition of the wholesale sales tax system and a more favourable diesel rebate system) came into effect on 1 July 2000. The mining and petroleum industry is expected to gain from these changes as under the GST, for example, exports are zero rated, meaning, that no GST is paid on the final sale of those products. These measures will reduce industry costs and further increase the State's international competitiveness in the resources area.

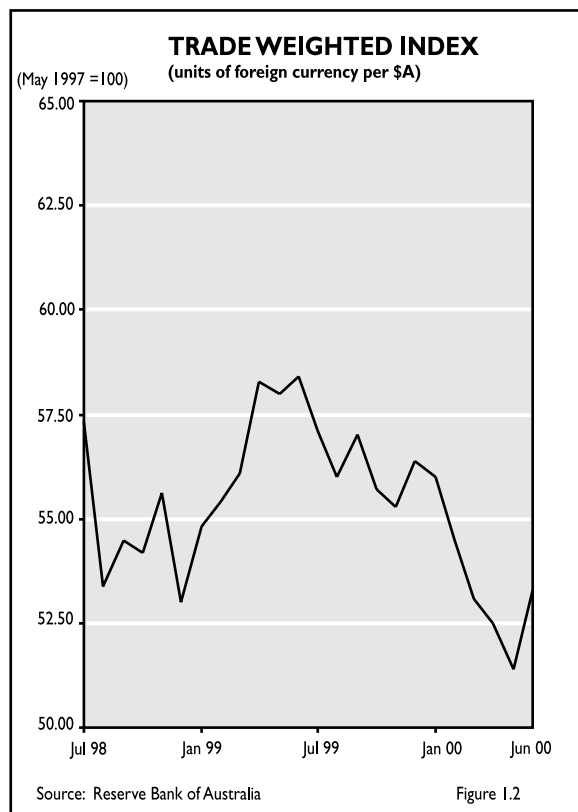
As part of its response to the Ralph Report (June 1999), in December 1999 the Commonwealth Parliament passed a number of new taxation measures. These included a reduction in the corporate tax rate from 36% to 34% for the 2000-01 income tax year and to 30% thereafter.

As part of its funding for these December 1999 measures the Government, in line with the Ralph Report recommendations, abolished accelerated

depreciation for assets purchased after 9:45am, 21 September 1999. For these items depreciation is now based on the “effective life” of the asset.

It is now apparent that the overall benefits of the tax reform process initiated by the Commonwealth will be unequally spread across the mining industry. Companies planning large-scale capital expenditures will be likely to have the benefits derived from the proposed lowering in the company tax rate and the GST package outweighed by the abolition of accelerated depreciation. Loss of accelerated depreciation will reduce the internal rate of return of large-scale developments and its removal could shift shareholder investments towards less capital-intensive sectors.

In recognition of this the Commonwealth Government has set up the Strategic Investment Co-ordination Process. The investment incentives that could be provided under this scheme include grants, tax relief or the provision of infrastructure services. For very large capital-intensive projects of national significance that have net economic (specifically employment) benefits, the Process will also take into consideration the impact of tax reform on the viability of the project and offer tax-based incentives accordingly.



1.3 Social and Political Factors Affecting the Mining Industry

Native title continues to be a major issue impacting on the industry.

The Western Australian Government has been using the future act procedures of the Federal *Native Title Act (NTA)* since March 1995.

As at 31 July 2000 native title claims covering approximately 81% of the State had been registered with the National Native Title Tribunal (NNTT). The distribution of these claims is such that about 98% of all mineral title applications in Western Australia must now be processed via the future act regime of the NTA.

In the period from 16 March 1995 to 31 July 2000, the Department referred 19,116 mining and petroleum tenement applications to the NTA future act procedures. Of these, 10,637 (56%) have been cleared for grant after a delay of about six months.

The delays experienced with mining leases have been much greater than compared to exploration licences. To 31 July 2000, 4,464 applications for mineral titles are subject to the right to negotiate procedures under the NTA. Over this period 471 agreements have been finalised involving 369 mining leases.

State Parliament passes legislation to establish State Native Title Commission.

In accordance with passage of the Commonwealth Government's *Native Title Act Amendment Act 1998*, on 15 October 1998 three native title Bills were introduced into the Western Australian Parliament comprising:

- i) The Titles (Validation) and Native Title (Effect of Past Acts) Bill 1998;
- ii) The Native Title (State Provisions) Bill 1998; and
- iii) The Acts Amendment (Land Administration, Mining and Petroleum) Bill 1998.

The Titles (Validation) and Native Title (Effect of Past Acts) Bill validates mining and petroleum grants made and confirms extinguishment of native title by past acts. The Bill was passed by State Parliament in mid-1999 and essentially validated 9,000 land and mining titles that were issued between January 1994 and December 1996 (High Court's Wik Decision).

The Acts Amendment Bill 1998 was passed by Parliament and assented to in December 1998. It provides consequential amendments to existing State Acts and imposes native title liability compensation obligations on industry for future acts.

The *Native Title (State Provisions) Act*, was passed by State Parliament in December 1999. Among others, the Act facilitates the establishment of a State Native Title Commission. Nonetheless, under the Commonwealth's *Native Title Act Amendment Act 1998*, Senate approval is required for any State-based native title regime. At the time of writing (September 2000) Senate approval had yet to be attained.

Miriuwung and Gajerrong Native Title Decision may provide an insight into the nature of native title, its proof and extinguishment.

On 24 November 1998 the Federal Court made its first court-contested determination on native title in mainland Australia. The Court confirmed that native title could co-exist with other forms of land tenure. The native title claim by the Miriuwung and Gajerrong people covered 7,000 square kilometres of the East Kimberley region.

Virtually all the area claimed was allowed with a few exceptions. The Court ruled, among others, that the native title holders had access rights and the right to trade in resources and to receive a portion of resources taken from the area claimed.

On 26 July 1999, the Full Federal Court commenced hearing an appeal against the Miriuwung and Gajerrong decision, with the final decision handed down on 11 May 2000. By a majority of 2 to 1, the Full Federal Court substantially upheld the appeal and made some important findings about the nature of native title, its proof and extinguishment. Particular findings of the decision pertinent to the minerals industry are:

- ◆ The Miriuwung and Gajerrong people's claim to native title over the area in question was upheld, but native title had been extinguished to a greater extent than previously determined;
- ◆ Native title was akin to a "bundle of rights", generally amounting to personal rights and not an interest in land;
- ◆ Pastoral leases extinguish native title where they have been enclosed or improved;
- ◆ Major projects such as the Ord Irrigation and the Argyle Diamond projects extinguished native title;
- ◆ Native title rights to minerals and petroleum were extinguished by legislation; and
- ◆ The State's mining leases extinguished native title.

Guidelines encompassing these principles have been enacted at the State level. Where title applicants can demonstrate that native title has been extinguished, according to the principles set out in the Miriuwung-Gajerrong appeal decision by the Full Federal Court, title will be granted. Nonetheless, applications have been made for leave to appeal the Full Federal Court decision to the High Court.

The Framework Convention on Climate Change (FCCC) establishes the mechanisms for international cooperative action on greenhouse gases.

The Framework Convention on Climate Change (FCCC) established the mechanisms for international cooperative action on greenhouse gases. The international commitments under the FCCC were concluded at the Third Conference of the Parties held at Kyoto, Japan in December 1997.

The FCCC provides a two-point strategy to combat greenhouse emissions. Signatories to Annex 1 of the FCCC - which essentially are developed countries - are expected to be at the forefront of reducing their greenhouse gas emissions. Those countries that are not signatories to Annex 1 are expected at a later stage to pursue FCCC commitments (i.e. once they are considered to be developed countries). Australia is a signatory to Annex 1 of the FCCC while its main resource sector competitors (e.g. China and India) are not.

Kyoto outcome satisfactory for Australia.

From an Australian perspective the Kyoto outcome was satisfactory. Whilst the agreement, if ratified, will lead to a 5.2% reduction in world greenhouse emissions below 1990 levels by 2012, Australia was one of three countries permitted to increase emissions. Under the deal Australia is allowed an 8% increase in greenhouse emissions between 1990 and 2012.

Whilst the protocol has yet to be ratified at the international level, the Commonwealth Government has instigated a State- and Territory-based process aimed at meeting Australia's Kyoto commitments.

In general, some of Western Australia's export goods have high greenhouse emissions and the State's belief is that it should not be unduly penalised for producing these. The State Government has previously argued that this problem largely stems from the Kyoto outcome whereby greenhouse emissions are sourced back to the country where the good is produced rather than where it is consumed. For example, even though LNG is exported and substitutes for energy sources with greater carbon emissions abroad, the emissions associated with its production are allocated to Australia, and this is despite the importing country benefiting from a general lowering of its emission levels through the utilisation of LNG. In addition, the State's LNG producers' major competitors are mostly in countries that are not signatories to the Kyoto protocol and this gives them a distinct competitive advantage.

It was pleasing that in September 2000 the Commonwealth Government incorporated the State's views in its Kyoto policy response statement. The Commonwealth stated that a core principle underlying its greenhouse policy and abatement programs is that it should not have any negative impacts on those industries operating in an internationally competitive environment and whose output would contribute, in a global sense, to a lowering in world greenhouse gas emissions. This announcement has essentially exempted LNG, among others, from greenhouse policy and as a result Woodside is likely to proceed with the \$3 billion construction of a fourth LNG processing facility at its NWS project.

2. RESOURCE FOCUS 1999-00

2.1 Overview and Outlook

In 1999-00, the State's minerals and energy sector set a new record, with the value of sales rising by 27.7% to nearly \$21.3 billion. This compares with the decade average annual growth rate of 6.4%. Given that the industry, in sales-value terms, contracted by 7.1% in 1998-99, the 1999-00 outcome is even more outstanding.

Whilst most of the State's minerals and energy industries recorded growth in sales quantities, the overall rise in production value for 1999-00 is mainly attributed to a general and sustained improvement in commodity prices in addition to better than anticipated results for the petroleum sector. Throughout 1999-00 world economic conditions progressively improved and this was the underlying catalyst for higher commodity price outcomes over that year. The Australian dollar appreciated marginally in 1999-00.

The 1999-00 results for petroleum are impressive and further entrench the position of this sector as the State's leading resource industry. In 1999-00, the value of petroleum sales increased by 88%, or about \$3.6 billion to \$7.6 billion. Petroleum's share of total production value has increased from around 22% in 1990-91 to 36% in 1999-00. The next best sector, iron ore, which sold \$3.7 billion worth of output in 1999-00, has seen its share of total production value fall from 22% to 18% over the corresponding period.

With the new millennium approaching, it is worthwhile to examine the growth prospects of the State's resource sector. Overall, it is anticipated that Western Australia will be able to maintain its prominence on the international minerals scene well into the 21st century. The latest data (1999) show, that the State supplied (by quantity) around 18% of the world's alumina production, 43% (mainly industrial grade) of its diamond production, 8% of its gold production, 25% of its ilmenite production, 14% of its iron ore production, 9% (world trade) of its LNG production, 12% of its nickel production, 24% of its rutile production 4% of its salt production and 31% of its zircon production.

Following a substantial decline in oil prices in 1998-99, prices rebounded in 1999-00 averaging US\$25.31 per barrel, up 86% on 1998-99. The recent and sustained recovery in oil prices has been remarkable, with prices rising from a low of US\$9.50 in early February 1999

to a peak of US\$31.74 per barrel in late June 2000. This price rise has been principally due to OPEC member nations being able to restrict oil supply and adhere to their assigned production quotas. This adherence to defined quotas and its impact on oil prices has surprised world oil markets, given that past OPEC attempts to influence oil prices invariably collapsed due to its inability to enforce production quotas on individual member countries.

On the back of strong oil prices the value of the State's petroleum sales increased by 88% to \$7.6 billion. Oil was the largest industry in the petroleum sector with sales quantities increasing 32% during the year. Higher oil sales volumes and prices resulted in the value of sales rising 167% to \$3.2 billion. The main reason for increased sales quantities of oil was the return to full production of the Cossack-Wanaea fields. These fields had been temporarily shut down in 1998-99.

The value of LNG sales increased by 37% to \$2.0 billion in 1999-00, with sales quantities rising 0.4%. The value of condensate sales rose by 113% to \$1.6 billion, whilst sales quantities rose by 14%. Increased condensate production was mainly due to increased production from the North Rankin and Goodwyn projects.

Increased contract volumes resulted in natural gas sales volumes rising by 2% in 1999-00. However, higher contract prices resulted in more moderate growth in natural gas sales which rose by 5% to \$579 million. Liquefied petroleum gas sales quantities increased by 20% to 777,000 tonnes, with the corresponding production value rising by 128% to \$335 million.

Despite iron ore sales volumes increasing by just over 7% in 1999-00, the value of sales fell by 5% to \$3.7 billion.

The overwhelming reason for the 5% fall in the value of iron ore sales for 1999-00 was the result of the outcome of the February 1999 iron ore price negotiations with the Japanese. For the Japanese fiscal year (April 1999 to March 2000), the State's three major producers accepted lower US\$ prices. BHP and Hamersley received an 11% and 10.2% cut in the price received for lump ore and fine ore respectively. North Limited's Robe River operations accepted a 13.4% cut.

These price-cuts stemmed from lacklustre conditions in world steel and pig iron markets operating at that time. Since then the turnaround in world economic activity to more favourable levels has helped the State's iron ore producers to secure higher prices in the latest negotiations with the Japanese, with those prices applying for the period April 2000 to March 2001.

In 1999-00, the quantity of gold sold fell by 7% to 204 tonnes. The main reason for the fall in output was the interruption to production caused by extreme wet weather in the March quarter, in addition to the closure of some projects due to depleted reserves and/or high operating costs. Western Australia continues to produce around three-quarters of Australia's gold output. Overall, lower sales volumes and gold prices saw the value of output fall by 9% to \$2.9 billion in 1999-00.

Over recent years low US\$ gold prices have inevitably seen the gold mining industry in Western Australia undergo some rationalisation. This has manifested itself through tenement/lease rationalisation, closures and consolidation of operations, improvements in plant efficiencies and processing capabilities and also the expansion of some mining companies via corporate take-overs and acquisitions. Many of these strategies are aimed at improving economies of scale in an effort by the industry to reduce costs.

Both sales value and sales volume records were broken by the State's alumina industry in 1999-00. The sales volume of alumina increased by 6% to 9.4 million tonnes, while higher prices saw the value of sales increase by 12% to \$2.7 billion.

In June 2000, the expansion of the Worsley refinery was completed. The expansion will increase Worsley's alumina production from the present level of 1.8 million tonnes to 3.1 million tonnes per annum. Worsley also expects to reduce its operating costs thereby entrenching its position as one of the world's lowest cost alumina producers.

The State's other alumina producer, Alcoa, completed work on its Wagerup refinery expansion in October 1999. The Wagerup refinery previously had a production capacity of 1.75 million tonnes per annum and following the expansion, capacity was increased to 2.2 million tonnes per annum. The expansion is

the first stage of an overall program to increase Wagerup's capacity to 3.3 million tonnes per annum.

The quantity of Western Australian nickel sold grew by 14% to approximately 143,000 tonnes of contained nickel metal in 1999-00. With average nickel prices rising substantially in 1999-00, combined with higher output, this sector experienced a 103% increase in the value of sales to \$1.8 billion. In 1999-00 Western Australia accounted for almost all of Australia's nickel production.

In the longer term, the State's nickel production is expected to be largely boosted by the new laterite projects (Cawse, Murrin Murrin and Bulong) reaching full capacity and their proposed expansions proceeding. These projects have experienced technical difficulties in reaching full production capacity, but they are expected to do so in 2000-01.

The performance of the State's mineral sands industry sector was relatively mixed in 1999-00. In sales value-terms the industry increased by 8% in 1999-00. Overall, \$732 million worth of mineral sands products were sold in 1999-00.

The largest sector (by value) of the State's mineral sands industry is upgraded ilmenite (synthetic rutile). In 1999-00, strong synthetic rutile prices saw the value of sales rise by 19% to \$327 million, with this result achieved despite a 29% drop in sales volume. Sales quantities of ilmenite fell by 11% in 1999-00. The fall in ilmenite sales volumes was slightly moderated by higher prices, but overall the value of ilmenite sales dropped by 4% to \$153 million in 1999-00.

The rutile sector experienced adverse market conditions in 1999-00 with sales volumes falling by 18% to 98,000 tonnes, and value falling by 20% to \$72 million. Zircon sales volumes increased by 21% in 1999-00, but lower prices resulted in an overall increase of 11% to \$151 million in the value of these sales.

In 1999-00, the value of diamond sales rose by 15% to \$704 million, breaking the previous year's record. This result was achieved despite a 0.5% drop in sales volume to 51 million carats. The Argyle joint venture (participants Rio Tinto and Ashton Mining) project is the State's sole diamond producer.

The value of base metal sales (copper, lead and zinc) increased by 43% to \$332 million in 1999-00. Higher sales quantities, in addition to stronger copper and zinc prices, were the catalysts for the rise.

The salt industry increased its sales quantities by 3% in 1999-00, but lower prices resulted in the value of these sales falling by 7% to \$185 million.

Whilst the amount of coal sold in 1999-00 increased by 12%, lower contract prices led to the value of sales rising less than that (by 6%) to \$272 million.

2.2 Petroleum

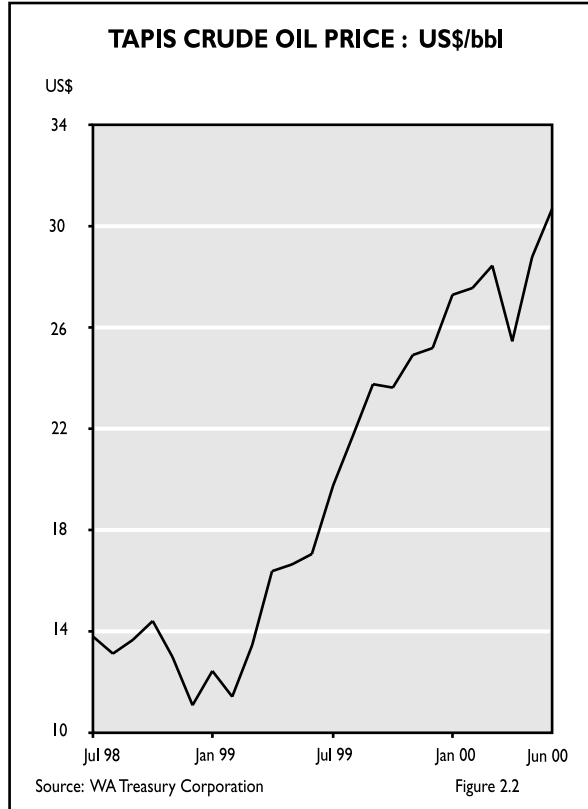
After weathering a period of record low prices in 1998-99, petroleum, the State's largest resource sector by value, witnessed a dramatic turnaround in 1999-00 with its value increasing by a mammoth 88% to set a new record of \$7.65 billion.

Approximately 80% (by value) of the State's petroleum products were exported in 1999-00. The major destinations were Japan (46%), USA (12%), China (11%), South Korea (10%), Singapore (10%) and Taiwan (8%).

Latest comparable figures indicate that Western Australia accounts for around 47% of Australia's oil and condensate production.

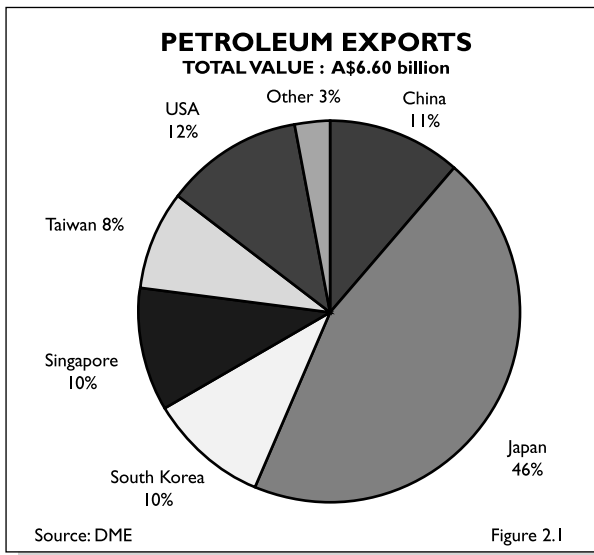
1999-00 Petroleum Industry Highlights

After declining almost continuously for 16 months, the world average trade-weighted price of crude oil bottomed at US\$9.50 a barrel in early February 1999 – the lowest price in real terms since 1973. However,



by early May 1999, prices had increased by more than 70% to US\$16.20 per barrel. This initial recovery in price occurred in the weeks prior to and after the May 1999 announcement by OPEC cartel members, as well as Norway and Mexico, that they would restrict supply as a means to increase the oil price. Since then OPEC supply restrictions, in addition to strong world economic growth, saw the oil price average US\$25 per barrel in 1999-00, up by an astronomical 86% on the 1998-99 average of around US\$14 per barrel.

In 1999-00 crude oil was the State's most significant petroleum product, surpassing LNG and accounting for 42% of total petroleum sales. Overall, the quantity of crude oil sold increased by nearly 32% during the year. This, added to the strong oil price, resulted in the sales value increasing by 167%. The main reason for the overall increase in the quantity of oil sold was the return to full production of the Cossack Pioneer floating production vessel which had been shut down in early 1999 and sent to Dubai for a \$190-million refit that took six months. The refit was to enable maximum oil production capacity to be increased from 85,000 to 115,000 barrels per day and for maximum gas production to increase from 94 to 143 terajoules per day. The Lambert field was brought on stream in October 1999, as a tieback to the Cossack



Pioneer floating production facility. In addition, BHP Petroleum's Buffalo field, located in the Bonaparte Basin, commenced production in December 1999 with Apache Energy's Stag field also recording increased sales quantities in 1999-00. The sales from the remainder of the State's oil producing projects declined slightly over 1999-00.

The quantity of LNG sold in 1999-00 increased marginally (by 0.44%) to 7.4 million tonnes. The value of LNG sales increased by around 38% to just under \$2 billion. Western Australia is regarded as a significant supplier on the world market, accounting for 9% of world trade, with Japan being the major purchaser of the State's LNG. Some 134 LNG shipments were made during the year, with 127 going to Japan, five to the United States and two to South Korea.

The quantity of condensate sold increased by nearly 14% in 1999-00 and this combined with the strong oil price saw the associated value increase by 113% to \$1.6 billion. The increase in production was due to increased output from all condensate-producing facilities.

Increased sales contract volumes in addition to higher prices resulted in the quantity of natural gas sold

increasing by around 2% in 1999-00, with the value increasing by just over 5% to almost \$580 million.

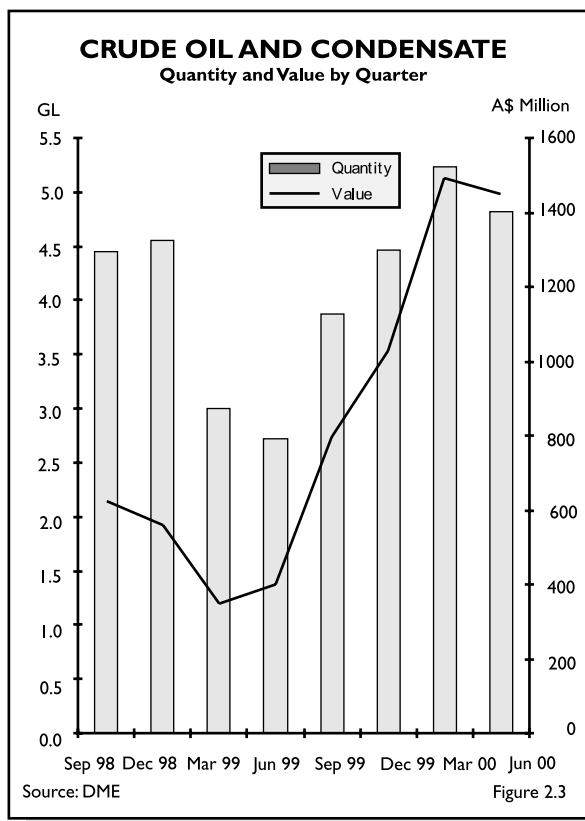
The quantity of liquefied petroleum gas (LPG – propane and butane) sold in 1999-00 increased by 20% to around 780,000 tonnes. Its associated value increased by 127% to \$337 million, again emphasising the impact of stronger prices. Whilst the vast majority of LPG production is exported to Japan, another export destination was Lebanon.

World Oil Market Outlook

At the time of writing, West Texas Intermediate (WTI) oil was trading at around US\$34 per barrel (13 September 2000). This was also just days after an OPEC announcement to increase production by 800,000 barrels per day, amidst widespread worldwide protests against high fuel prices. Prior to this the spot WTI price was around US\$35 per barrel, the highest oil price for ten years. This now means that the previous OPEC (excluding Iraq) quota of 25.4 million barrels per day will increase to 26.2 million barrels per day. However, due to OPEC already pumping around 600,000 to 700,000 barrels per day in excess of its quota, there was concern amongst analysts that in real terms OPEC would only increase production by 100,000 to 200,000 barrels per day.

The Saudi Arabian Oil Minister pledged that OPEC would produce 800,000 barrels per day on top of the current "leakage". Overall, this pledge to increase production had little impact on the oil price primarily due to it being perceived as "too little too late" to reach refineries in order to be processed into heating oil. This is needed to supplement already significantly reduced heating oil inventories in the US and Europe – especially as they are heading into winter.

OPEC has pledged to meet again in early November 2000, however the OPEC countries have very little scope to increase production any further. Six of the 11 OPEC members have a combined excess capacity in the vicinity of only 2 million barrels per day, with Saudi Arabia in control of the vast majority. Overall, the oil market is being driven by exceptionally strong world demand. However, if the strong demand is to continue driving oil prices even higher this could inhibit the economic recovery in heavily oil-reliant Asian countries such as China, South Korea, Taiwan and Thailand.



On the non-OPEC supply front, there is little scope for a significant increase in production over the next couple of years due primarily to the lack of potential fields to fill the void. However, over the next three to five years the prospect for increased non-OPEC production is much more favourable, especially as the current high oil prices will encourage considerable focus on the exploration and development of new fields. Non-OPEC producers are estimated to account for around 60% to 65% of world oil supply.

According to ABARE (June 2000), world oil production fell by nearly 2% to 74.1 million barrels per day in 1999. It is estimated to increase to 76.6 million barrels per day in 2000 and then rise further to 78.6 million barrels per day in 2001. World oil consumption increased by around 2% in 1999 to 75.1 million barrels per day, with ABARE forecasting world oil consumption to rise to 76.5 million barrels per day in 2000 and 78.4 million barrels per day in 2001.

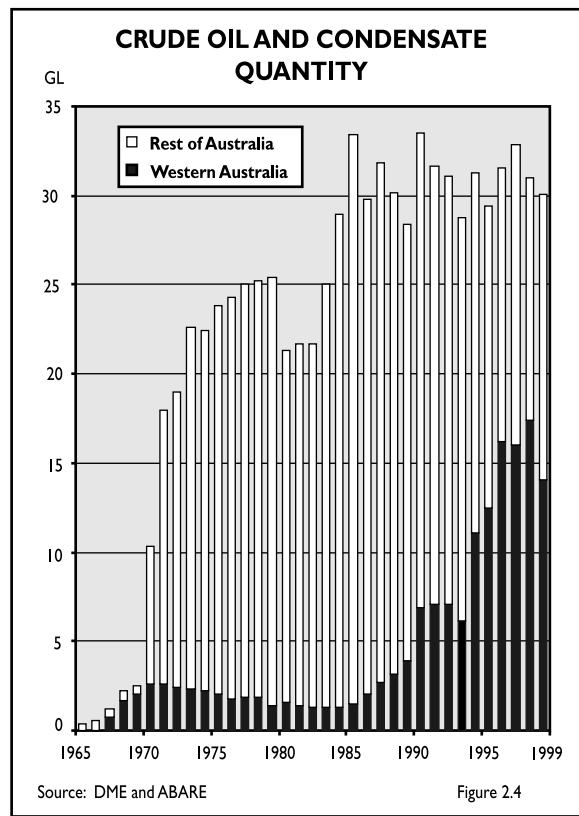
Owing to the above factors, it is widely anticipated that the oil price is likely to average at least US\$30 per barrel for the remainder of 2000-01, due largely to continued tight supplies, low inventories and strong global demand.

State Outlook

Given the recent strength of the oil price, the continuation of the Asian economic recovery and the generally upbeat outlook for the world economy, Western Australia's petroleum industry is poised to undergo a further period of growth and development.

In particular, the potential for further development in the LNG sector was highlighted throughout 1999-00. Australia LNG (ALNG), a Perth-based consortium set up to market LNG from the North West Shelf Gas Project, has been focusing on securing new contracts in China, Taiwan and India. Even so, the construction of a fourth train is likely to get the formal go-ahead from the North West Shelf partners by early 2001 as the North West Shelf partners appear certain to secure the additional contracts (with their Japanese customers) that are necessary for the final investment decision to proceed.

The \$8-billion (assuming full development) Gorgon project could also proceed if attempts by its partners - Texaco, Chevron, Mobil, Shell and BP - to secure long-term contracts with large industrial gas customers



Source: DME and ABARE

Figure 2.4

within Western Australia succeed. Texaco announced in late October 1999 that it had joined energy utility group CMS Energy to investigate the viability of a second gas pipeline from Onslow to Geraldton, with Texaco's belief that some domestic gas consumers are hindered by the strict quality requirements and consequently higher tariff of the Dampier-to-Bunbury pipeline. Texaco is of the opinion that there is a potentially large gas market in Western Australia for lower quality and hence cheaper gas to supply industrial needs. Potential customers could include Dow-Shell's \$3-billion Pilbara petrochemical plant, which is currently under consideration. The Gorgon partners have indicated, however, that they will still continue their efforts to secure long-term LNG customers in Korea, China and other parts of Asia.

Future LNG developments received an additional boost in August 2000 when the Federal Government announced that, with respect to the LNG industry, it will avoid Greenhouse policies and measures which distort investment decisions between particular LNG projects and locations. This in turn will allow Western Australian projects to compete on a far more equal

footing with countries such as Indonesia, Malaysia, Oman and Qatar, as these countries will not be subject to Greenhouse gas reducing measures.

In September 2000, the North West Shelf partners announced that they had given final investment approval for the development of the Echo-Yodel gas and condensate field. Production from the field will be combined with existing production from the Goodwyn platform. It is expected to produce approximately 37 million barrels of condensate and 0.4 trillion cubic feet of recoverable gas over a four-to five-year period starting in 2002. The total capital cost of bringing the field into production is expected to be \$205 million. By bringing the field on-stream it will assist in compensating for the natural decline in condensate production from the much larger Goodwyn field.

Current forecasts indicate that crude oil production in Western Australia could decline in the longer term, unless significant new fields are discovered and/or come into production to replace the mature fields from which production is declining. Nonetheless, the maintenance of crude oil production received a boost with Woodside's announcement in October 1999 that it would proceed with development plans for the Legendre oilfields located in the North West Shelf area. The \$110-million project is expected to come on-stream in 2001, with initial production commencing at 40,000 barrels per day. The fields contain probable reserves of 40 million barrels with an expected project life of five to eight years.

Despite the availability of significant resources, Western Australia's natural gas production is largely dictated by domestic demand in the power generation sector. The gas sector is anticipated to grow strongly over the next 10 years due to rising demand in the industrial sector. This was highlighted in December 1999 when the North West Shelf partners revealed they had won a \$200-million contract to supply Alinta Gas with an extra 40 terajoules per day of natural gas over ten years, starting from 2002. The partners beat competition from eight other suppliers to gain the contract that adds to contracts already held with Alinta Gas. Existing contracts include an agreement to supply Alinta Gas with 118 terajoules per day until 2005, when a contract for 80 terajoules per day until 2020 comes into effect.

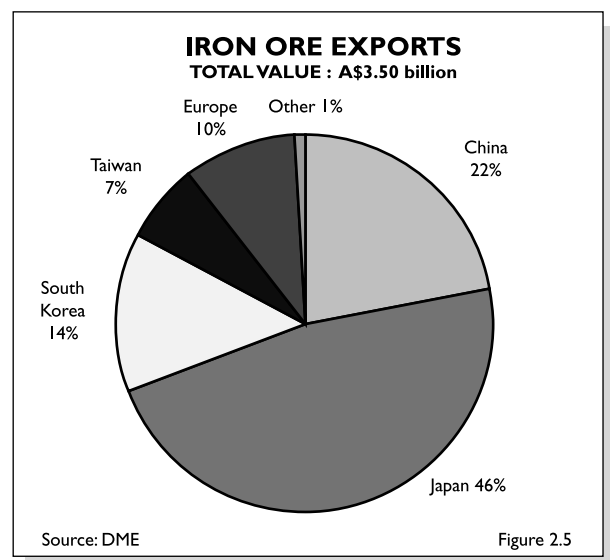
2.3 Iron Ore

Iron ore is the State's second most valuable export commodity, after petroleum, worth \$3.66 billion in 1999-00. The vast majority (96%) of Western Australia's iron ore was exported overseas in 1999-00 with 46% (by value) going to Japan, followed by China (22%), South Korea (14%) and Europe (10%).

Western Australia is the world's third largest producer after China and Brazil and accounts for approximately 92% of Australia's iron ore production.

Iron ore sales grew by a modest 7.2% while the value of sales decreased by 4.5% in 1999-00 to \$3.72 billion. This was the result of a combination of factors, namely, lower contract prices, modest appreciation of the Australian dollar, and significantly reduced domestic demand.

The outcome of iron ore contract negotiations for the Japanese fiscal year (April 1999 to March 2000) was that Western Australia's major producers accepted lower US\$ prices. Furthermore, although Robe River was able to maintain previous export volumes, both BHP and Hamersley agreed to lower the volume of their exports to Japan. The combined effect of lower prices and volumes and an appreciation of the Australian dollar over the period 1 July 1999 to 30 March 2000 (the end of the contract) was to lower the value of export sales. This, in addition to the significant reduction in domestic demand (15.5%)

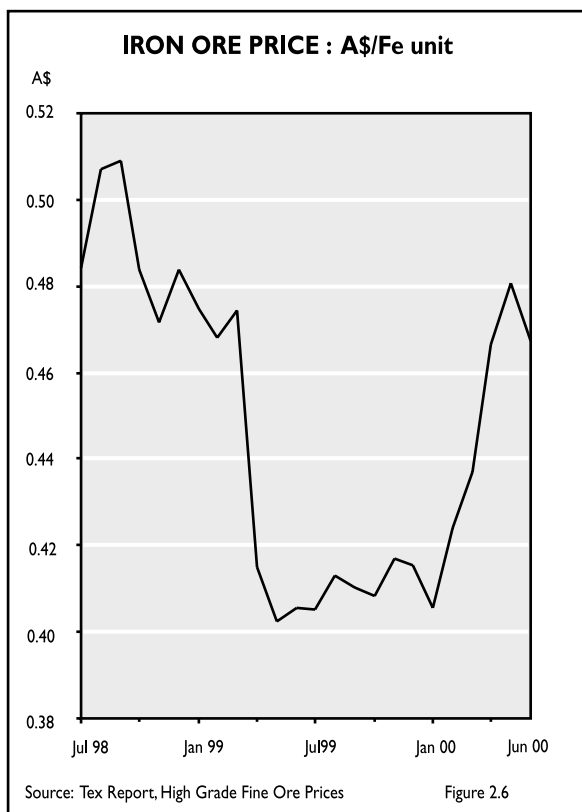
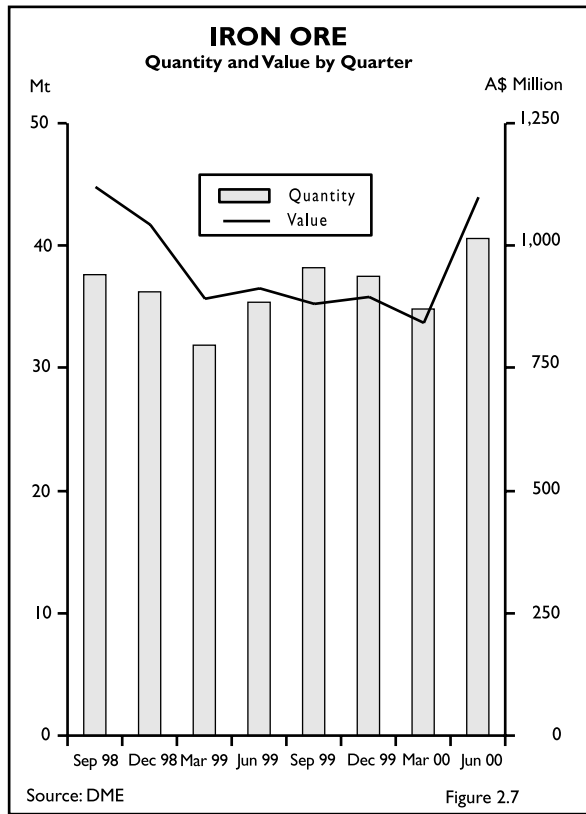


resulting from the closure of BHP's Newcastle steel mill in October 1999, produced slower growth in the total volume of sales and negative growth in the value of sales over 1999-00.

Iron ore contract negotiations for the Japanese fiscal year (April 2000 to March 2001) were settled with the Japanese steel mills in March 2000 with WA's iron ore producers agreeing to a price increase of 4.35% for iron ore fines and a 5.77% increase in the price of lump ore.

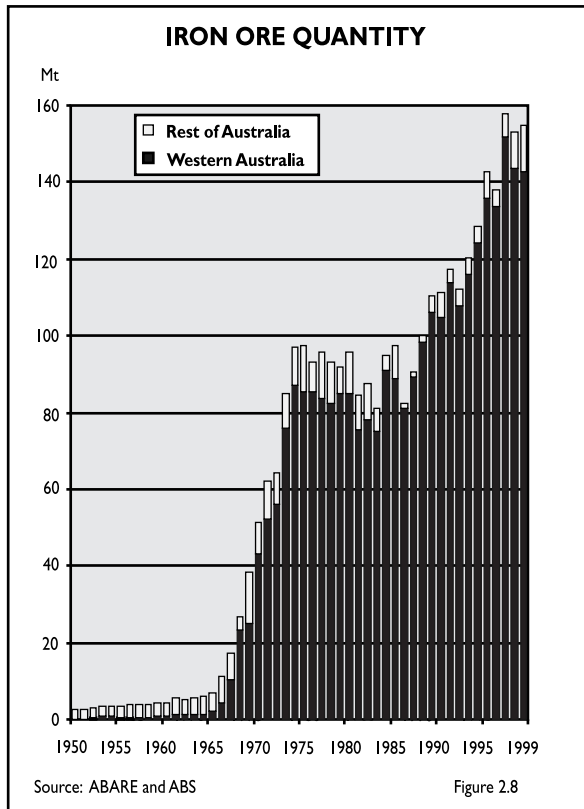
1999-00 Iron Ore Highlights

In August 2000, Rio Tinto defeated Anglo American in a take-over bid for North Limited despite opposition from the Japanese steel mills. The take-over is significant for the State's iron ore production because North was the 65% owner and operator of Robe River Iron Associates. Robe had planned to develop the West Angelas deposit in the Pilbara and to construct a 340-kilometre rail link to the company's existing railway in addition to an upgrade of its port and handling facilities at Cape Lambert. The take-over may change both the development parameters and timetable of the West Angelas deposit. In particular, Rio Tinto may



now integrate West Angelas with the Hamersley Iron rail and port infrastructure. This would allow Rio Tinto to make significant savings by avoiding duplicating the Hamersley rail line to the port of Dampier. This option was not open to North as it failed in its application, under the infrastructure access provisions of the *Trade Practices Act 1974*, to be allowed access to the existing rail line. Some industry observers have suggested that Rio Tinto may push to have the West Angelas project put on hold while others argue that the more likely outcome is that the project will proceed but at a slower pace than North was planning. This approach would allow Rio Tinto to extend the life of its Tom Price mine which produces premium quality ore.

The industry consolidation engendered by the take-over is also likely to have implications for the next round of price negotiations between the iron ore producers and the Japanese steel-mill-buying cartel. The consolidation of the Western Australian iron ore industry has changed the market dynamics and will shift the balance of price setting power away from the steel-mill-buying cartel and in favour of the iron ore sellers.



Outlook

The outcome of the next round of price negotiations with Japan will be dependent on the changed market structure and also on world economic conditions. The current indications are that the market is solid with world production of steel forecast to grow strongly in 2000-01 and growth declining slightly in 2001-02. Thus, world conditions in conjunction with the stronger bargaining position of Western Australian iron ore exporters indicate that higher prices are likely to be achieved for the Japanese fiscal period April 2001 to March 2002.

In volume terms, ABARE forecasts that stronger Asian demand will underpin a moderate increase in Australian iron ore exports in 2000-01. Specifically, increases in Asian blast furnace production and hence demand for iron ore are forecast to result in Australian iron ore exports rising by over 5% to 157.5 million tonnes in 2000-01.

The value of Australian iron ore exports is forecast by ABARE to increase by over 12% in 2000-01 to \$4.3 billion. The increase reflects the combined effects of an assumed weaker Australian dollar, increased volumes shipped and higher negotiated prices.

2.4 Gold

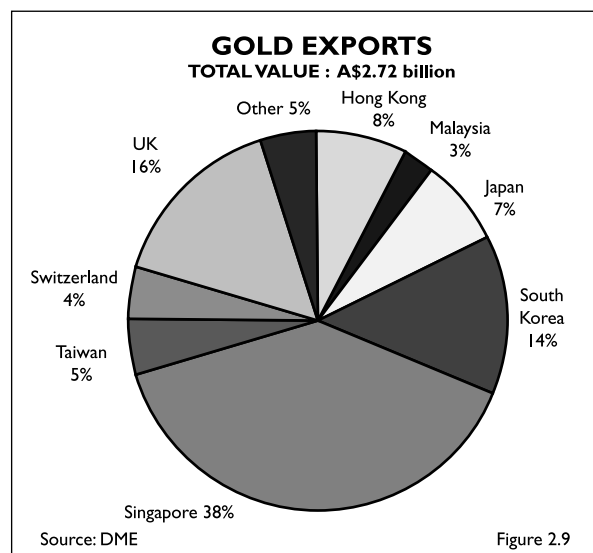
Negative market sentiment surrounding gold continued throughout most of 1999-00, making the sector one of the few not to benefit from strong prices. This resulted in the industry continuing moves to review, rationalise and amalgamate operations as a means to reduce costs.

The State's gold output dropped during 1999-00 by around 7% to just over 203 tonnes. The overwhelming factors responsible for lower production were interruptions and damage caused by Cyclone Vance in March 1999, as well as the closure of some projects due to depleted reserves and/or high operating costs. Overall the value of production fell by nearly 9% to \$2.94 billion, which apart from the fall in production, was also due to a 2% decline in the average AS gold price relative to 1998-99.

The international gold price averaged around US\$282 per ounce in 1999-00. This was down by 1% on the previous year and, more notably, was 8% lower than its 1997-98 average and 23% lower than the 1996-97 average price of US\$364 per ounce.

In 1999-00 the value of the State's gold exports totalled \$2.72 billion. Major gold export markets included Singapore (38%), the UK (16%), South Korea (14%), Hong Kong (8%), Japan (7%), Taiwan (5%), Switzerland (4%) and Malaysia (3%).

Latest comparable figures indicate that Western Australia accounts for around 72% of Australia's gold production.



1999-00 Gold Industry Highlights

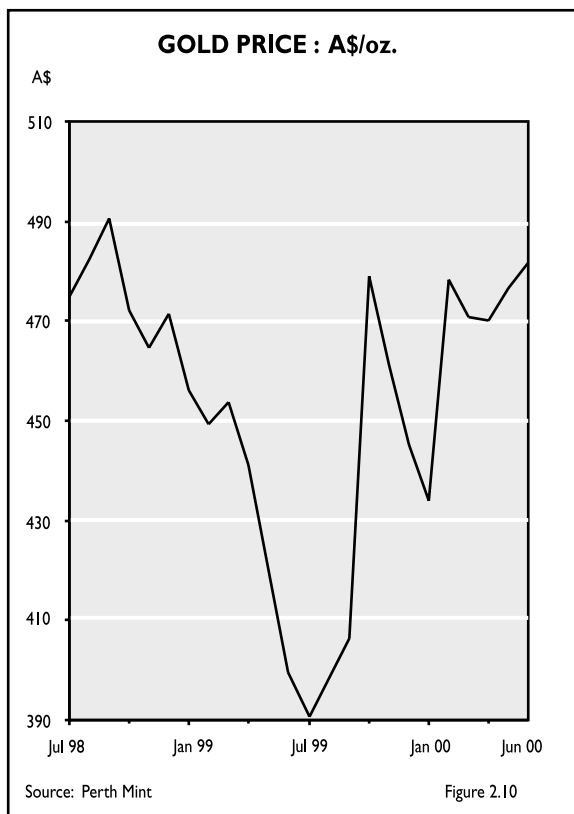
Around 54% of Western Australia's gold output in 1999-00 originated from the following 10 projects:

- ◆ Golden Mile/Super Pit (Normandy, Homestake) – 24.43 tonnes;
- ◆ Granny Smith (Placer, Delta Gold) – 15.13 tonnes;
- ◆ St Ives (WMC) – 12.92 tonnes;
- ◆ Jundee–Nimary (Normandy) – 11.14 tonnes;
- ◆ Kanowna Belle (Delta Gold) – 9.15 tonnes;
- ◆ Telfer (Newcrest) – 8.31 tonnes;
- ◆ Bronzewing (Normandy) – 7.80 tonnes;
- ◆ Plutonic (Homestake) – 7.68 tonnes;
- ◆ Boddington (Newcrest, Normandy, AngloGold) – 7.17 tonnes; and
- ◆ Tarmoola (PacMin) – 7.08 tonnes.

Over the last two years low US\$ gold prices have inevitably seen the gold mining industry in Western Australia undergo some rationalisation. This has manifested itself through tenement/lease rationalisation, closures and consolidation of operations, improvements in plant efficiencies and processing capabilities and also the expansion of some mining companies via corporate take-overs and acquisitions. Many of these strategies were aimed at improving economies of scale in an effort by the industry to reduce costs.

With respect to closures – the most notable one occurred in July 2000, when Newcrest Mining announced it was suspending operations at its Telfer gold mine, located in the Pilbara. The fundamental reason for this decision was high operating costs in the June quarter 2000. For that quarter, the average cash cost was approximately \$559 per ounce, compared to an average A\$ gold price of \$476 per ounce. Newcrest intends to undertake further exploration of the area in an attempt to shore up additional reserves which will allow the mine to re-open, within one to two years at a reduced operating cost and have an extended life.

Take-over activity has seen an increased presence of overseas gold mining companies in the State's gold

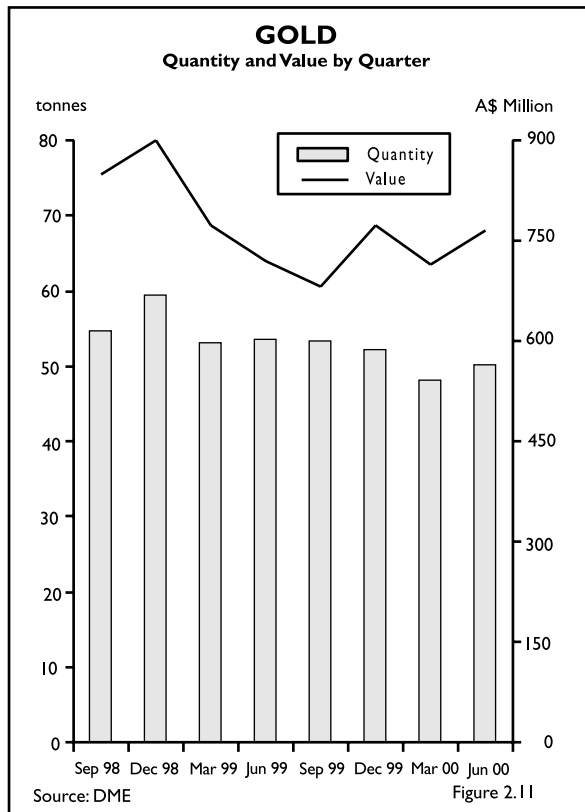


industry. One influencing factor has been the relative weakness of the A\$ over the last two years, which has acted to increase the attractiveness of local gold companies to overseas buyers. Examples of this occurred in early 2000 when large South African miner, Harmony Gold, acquired a stake in Goldfields Limited and international mining giant AngloGold took over Acacia Resources.

Throughout most of 1999-00 there had been an increasing trend for small mining companies to go "dot com" in order to cash-in on the vast amount of money chasing the "new economy" stocks in the information technology and telecommunications sectors. It had been estimated in early 1999 that approximately 100 of the 300 junior Australian gold producers and explorers joined the "dot com" ranks with predictions that a further 50 to 100 had plans to follow suit. However, at the time of writing (September 2000) this trend had virtually ceased due to such stocks moving out of favour in the market.

World Gold Market

According to ABARE (June 2000), the world's mine production of gold totalled 2,576 tonnes compared to demand of 3,722 tonnes in 1999. The supply



the international gold market over the last two years.

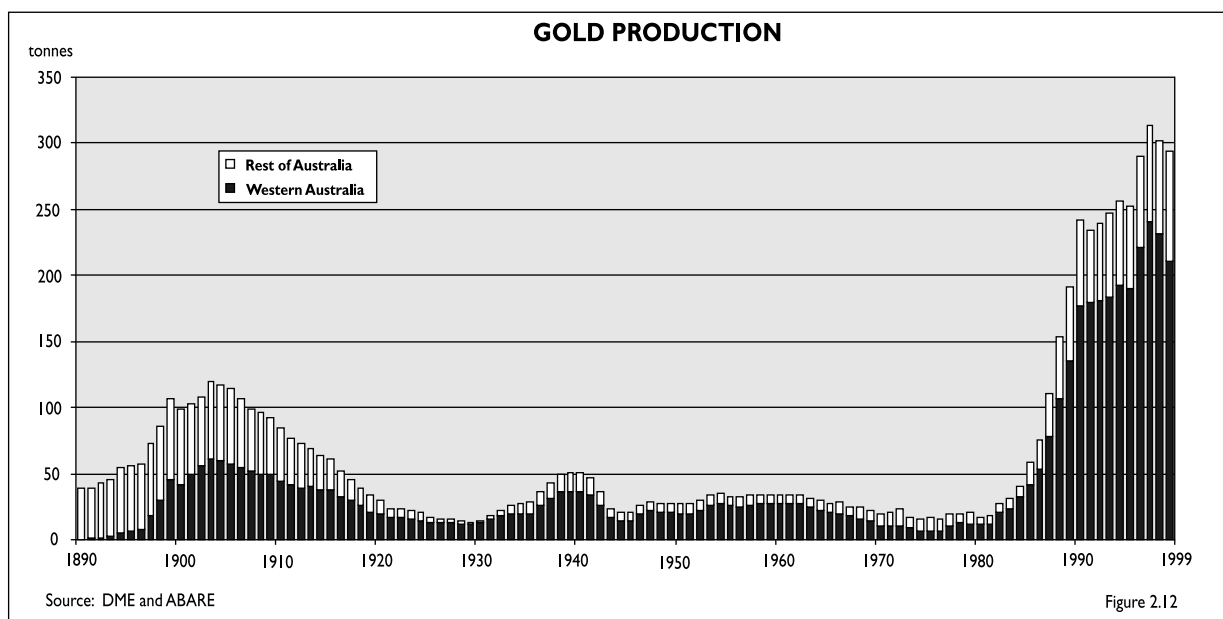
According to a survey undertaken by the IMF, aboveground world gold stocks, held by the banking (or official) sector, totalled around 33,000 tonnes in July 2000. Therefore, at the 1999 fabrication consumption rate of around 3,700 tonnes, gold stocks held by the banking sector equate to approximately nine years supply. This over-hang in supply is unique to gold in the commodity market. This, coupled with the phenomenal strength of the US dollar and hence the attractiveness of US-based investments, have meant that potential investors have increasingly questioned gold as an investment.

As a result of key international statements that effectively cap gold sales and lending by key central banks, the US\$ price of gold rose significantly in late September/early October 1999, peaking briefly at around US\$330 per ounce on 4 October 1999. This was its highest level since the latter half of 1997. Since then the US\$ gold price has seen a downwards trend, settling at around US\$272 per ounce in September 2000.

shortfall was essentially made up by official sector sales (i.e. central bank sales), sales of scrap gold in addition to supply from forward sales, private disinvestment, option hedging and gold loans. Central bank sales, and in particular the threat of these continuing at potentially high levels, have substantially dampened

Outlook

If the key central banks hold to commitments made during 1999-00, the gold price is likely to average around US\$280 per ounce for the remainder of 2000-01. ABARE (June 2000) has estimated world mine production of gold at around 2,587 tonnes compared



to demand of 3,886 tonnes for 2000. As a result there is scope for the market to absorb any proposed central bank gold sales without further weakening the gold price.

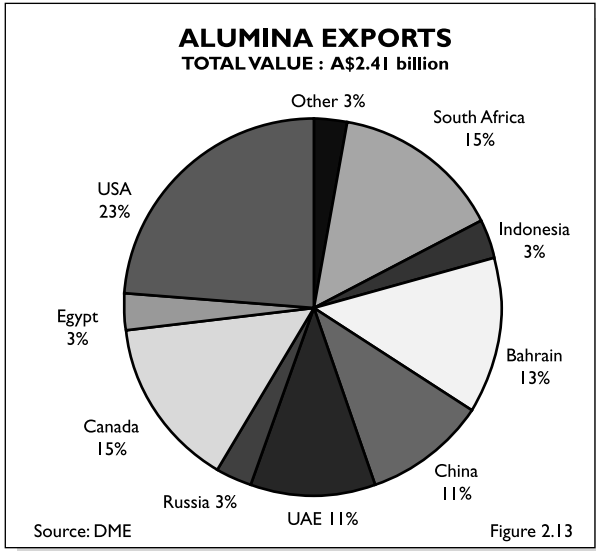
On the local scene, the gold industry received a boost with the announcement in February 2000 that PacMin Mining was going to proceed with the development of the \$40-million Carosue Dam project, 110 kilometres north-east of Kalgoorlie-Boulder. PacMin anticipates production in the vicinity of 110,000 to 140,000 ounces annually at a cash cost of \$300 per ounce. The project is expected to commence operation in early 2001 and have a life of approximately 10 years. In addition, St Barbara Mining announced it would resume production at its Meekatharra operations after being closed for 18 months. New Hampton Goldfields Ltd also announced they would re-start operations at Big Bell, which was purchased from Normandy Mining in 1999. The Boddington joint venture partners (Newcrest, Normandy and AngloGold) are expected to make an announcement by the end of 2000 or early 2001, regarding the \$300-million development of the Wandoo orebody as part of the Boddington project.

Regardless of these announcements, and especially in light of the closure of Telfer, it is estimated that the State's gold output will fall slightly from its 1999-00 level into 2000-01, before picking up again in the longer term. Nationally, ABARE (June 2000) has also forecast that Australia's gold production will fall slightly during 2000, before increasing in 2001.

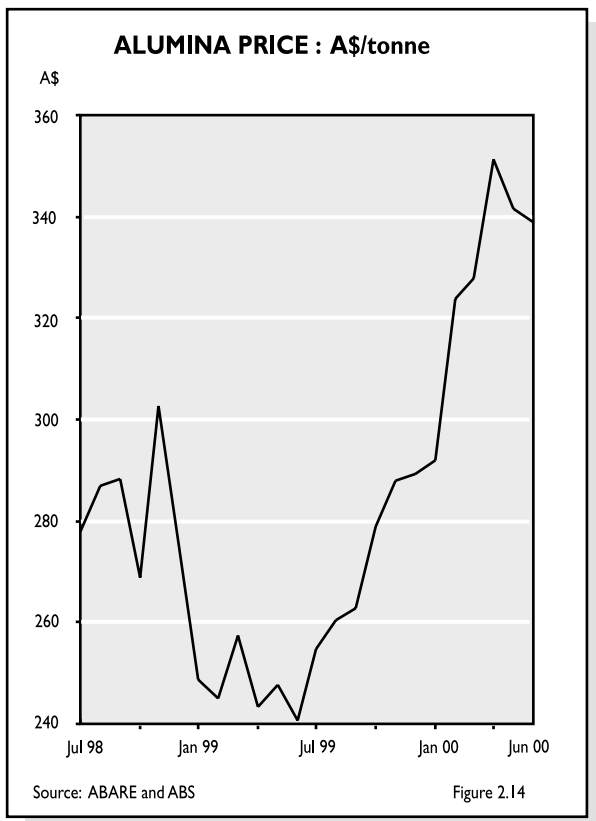
2.5 Alumina

Western Australia produces 18% of the world's alumina and accounted for just over 60% of Australian production in 1999-00. The vast majority (just over 90%) of the State's alumina is exported with the major destination, the USA, receiving 23% of the value of alumina exports in 1999-00. Other significant destinations are South Africa (15%), Canada (15%), Bahrain (13%), China (11%) and United Arab Emirates (UAE) (11%).

In 1999-00 the value of alumina sales increased by 12.3% to a new record high of \$2.66 billion, a remarkably strong performance given that in calendar year 1999 the value of sales fell by 5%.



The 1999-00 increase in sales value resulted from higher contract US dollar prices for alumina, which in turn reflected the strong increase in spot alumina prices in the second half of 1998-99. In addition, greater sales volumes contributed to the growth in sales value over 1999-00, increasing by 5.5% to 9.35 million tonnes, eclipsing the record high achieved in 1998-99.

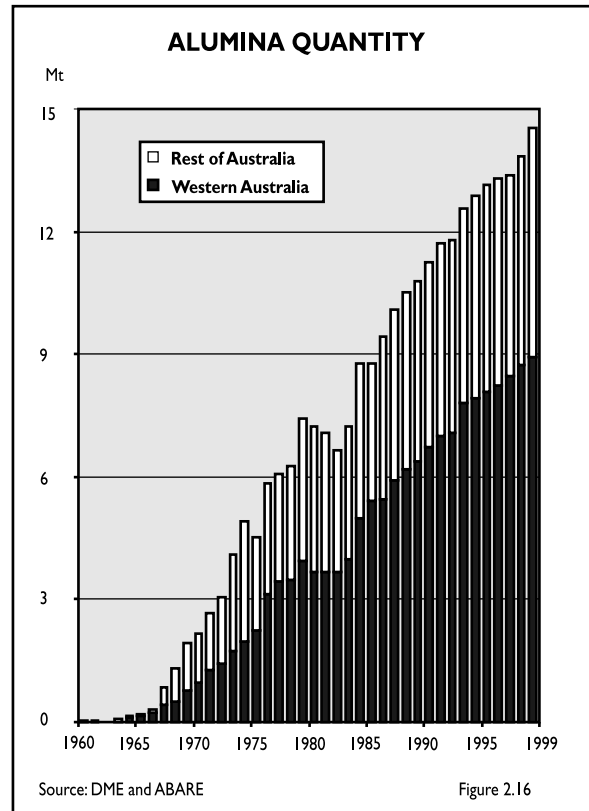


1999-00 Alumina Industry Highlights

Historically, spot alumina prices have shown a strong positive correlation with aluminium prices, where alumina prices have averaged around 13% of the LME aluminium price. However, spot alumina prices displayed significant volatility over 1999-00 increasing 160% over the period June 1999 to March 2000, peaking in May 2000 at around US\$425 per tonne (equivalent to 30% of the LME aluminium spot price). This peak was followed by a sharp fall to US\$250 in August 2000 (equivalent to 16% of the LME aluminium spot price).

The sharp increase in alumina prices followed a tightening in the alumina market precipitated by the July 1999 closure of Kaiser's Gramercy refinery in the US following an accident. In addition to this loss of production, strong growth in aluminium production resulted in considerable upward pressure on alumina prices throughout 1999.

The spot alumina price was lower in the three months to September in response to increased world production of alumina and a weaker aluminium spot price. An important contributor to the increase in production has been higher output from the Worsley

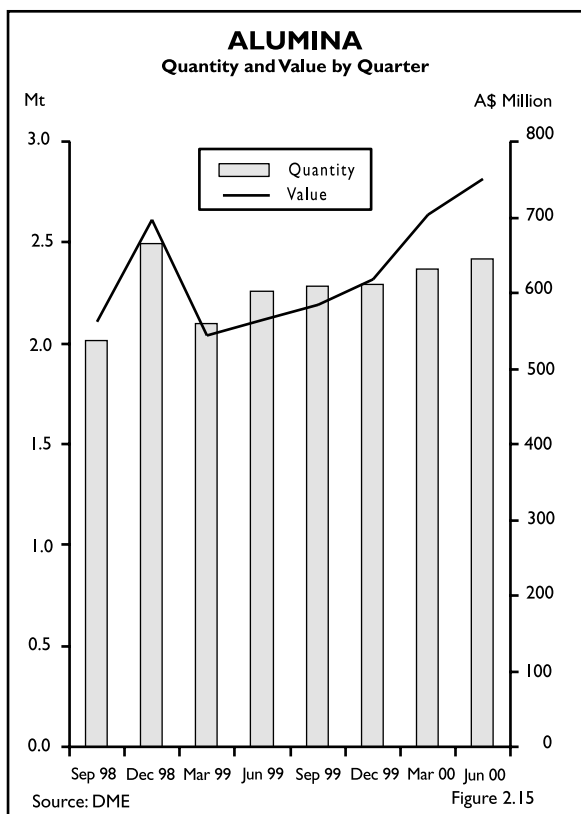


alumina refinery in Western Australia. In May 2000 Worsley completed the final stage of an \$800-million expansion project designed to increase production capacity to 1.3 million tonnes a year.

There was a change of ownership of Worsley in August 2000 when Billiton plc acquired a controlling stake (86%) in the alumina refinery for US\$1.49 billion (A\$2.61 billion). Billiton already owned 30% of Worsley when it bought an additional 56% interest from the US-based Alcoa Inc. Alcoa acquired the Worsley interest as part of its US\$4.5 billion take-over of US company Reynolds Metals. However, it was prevented from putting it into its Alcoa World Alumina and Chemicals joint ventures with WMC because of European and US regulatory authorities' concern that the group's dominance in the upstream end of the world aluminium industry would be anti-competitive. Alcoa won approval from the authorities for the Reynolds take-over only after it agreed to divest the Worsley interest. Billiton had pre-emptive rights over the Alcoa interest.

Outlook

ABARE forecasts an increase in Australian alumina export earnings of 22% to \$4.22 billion in 2000-01.



The major boost to earnings will come from higher Australian dollar prices due to an assumed continued low of the Australian dollar.

Although the average spot price for alumina (in Australian dollar terms) is forecast to fall substantially in 2000-01, the average value of Australian exports of alumina is forecast to be 10% higher at \$336 a tonne. This increase reflects the typical time lag between changes in world spot prices and the largely contract-based Australian alumina export unit values.

The other factor that will contribute to Australia's growing alumina export earnings is higher production volumes, the majority of which will be exported.

Alumina production from the Worsley refinery in WA is expected to increase by around 930,000 tonnes in 2000-01. This increase will come from the 1.3 million tonnes per annum capacity expansion currently being implemented.

2.6 Nickel

After falling in 1998-99 by 7%, the quantity of Western Australian contained nickel metal sold increased by 14% to approximately 143,000 tonnes in 1999-00. When combined with the very strong nickel price throughout the year, the sales value actually increased by around 103% to just under \$1.8 billion.

Western Australia currently accounts for all of Australia's nickel production.

Approximately \$1.84 billion worth of nickel was exported in 1999-00. The reason for this being greater than the value of sales is that a proportion of sales from the previous year (1998-99) was not actually shipped until 1999-00. The main export destinations were Finland, which received 25%, the rest of Europe (25%), Japan (23%), Taiwan (11%) and North America (10%).

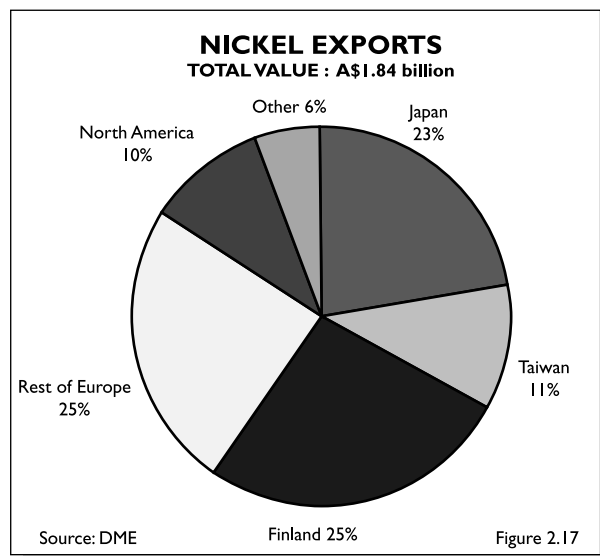
1999-00 Nickel Industry Highlights

The nickel market has been subdued in recent years due to surplus stocks, lacklustre demand from stainless steel producers, the ready availability of nickel and steel scrap from Russia plus the imminent start-up of new, low-cost nickel supplies, most of which will come from Western Australia. However, since reaching an

average monthly low of US\$3,875 per tonne in October 1998, the LME spot nickel price increased strongly to average US\$8,257 per tonne in 1999-00, up by a massive 85% on 1998-99. The fundamental reason for the strong recovery in price was a pick-up in Asian demand for stainless steel in the first half of 1999-00, which in turn led to increased production of stainless steel in the region. The strength of Asian demand for stainless steel resulted in a fall in exports to North America and Western Europe, in turn providing a boost for domestic production in those regions. These factors effectively underpinned an increase in world nickel consumption. In addition, world production of nickel had been cut in response to poor nickel prices. Also, Canadian production was significantly affected due to prolonged strike action.

Western Australia's increased nickel output in 1999-00 was mainly due to WMC returning to full production after reducing its nickel concentrate output in the previous year. Operations at the Kalgoorlie nickel smelter were stopped in early January 1999 due to a furnace leak and subsequent repairs and maintenance. In addition, the laterite projects – Murrin Murrin, Cawse and Bulong – have finally started to record significant sales, with production at all three projects steadily rising to the full combined capacity of 63,000 tonnes of nickel metal. On a combined basis, nickel metal sales from these projects were equal to around 13,000 tonnes of nickel metal in 1999-00 versus 500 tonnes in 1998-99.

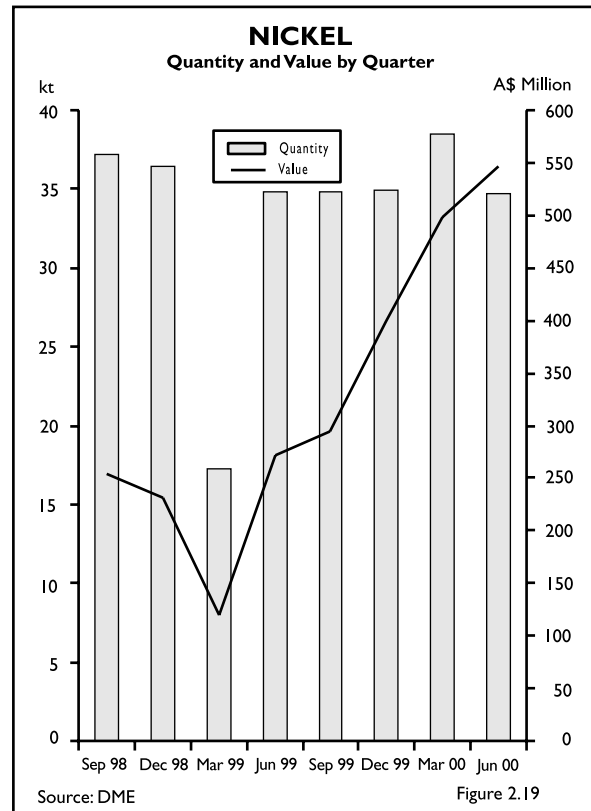
In September 1999, Outokumpu announced it was closing the Forrestania nickel mine due to a depletion



of reserves. During the project's seven-year life, it produced around 55,000 tonnes of contained nickel metal, in concentrate form, which were exported to Outokumpu's Harjavalta nickel smelter in Finland for further processing. Outokumpu has moved the Forrestania processing plant to its Black Swan nickel project, located 45 kilometres north-east of Kalgoorlie. Outokumpu is currently upgrading the existing processing plant at Black Swan, at a cost of \$13 million, to cope with increased production from the Cygnet and Silver Swan mines. As of February 2000, it is anticipated that Black Swan's annual production will be approximately 18,000 tonnes of contained nickel metal in concentrate form.

Outlook

In line with a continued improvement in stainless steel markets, ABARE (June 2000) has forecast world nickel consumption of just over 1.14 million tonnes in 2000, up by 6% on 1999, before rising to just under 1.2 million tonnes in 2001. However, due to historically low stainless steel stocks, combined with increased demand for stainless steel and a rebuilding of stocks, these factors could lead to final nickel consumption being higher than forecast. ABARE anticipates that

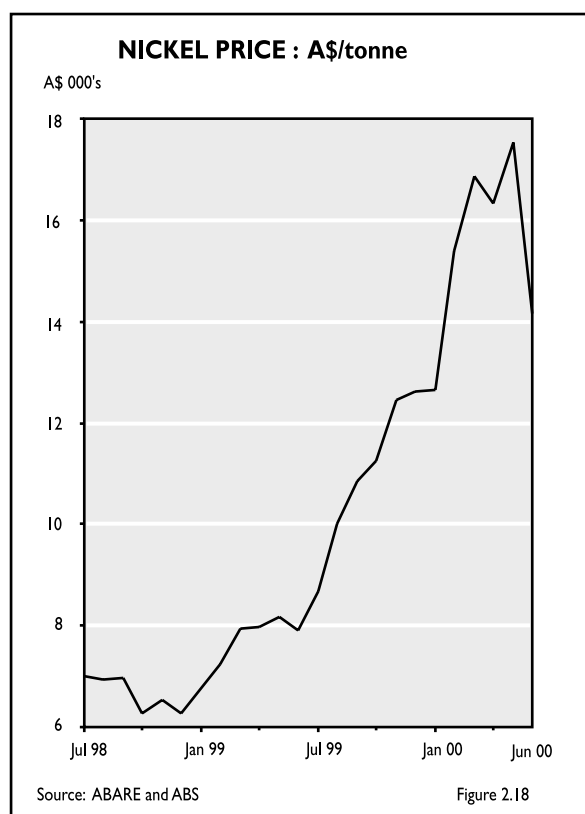


stainless steel production will continue to grow in 2000, but at a slower rate than that witnessed in the second half of 1999.

With respect to world nickel production, ABARE (June 2000) has forecast growth of around 9% in 2000, to 1.13 million tonnes. The expected increase in 2000 is largely attributed to increased output from the Western Australian laterite projects coupled with a rise in production from established producers in response to increased demand and hence stronger nickel prices.

On an overall basis, ABARE has forecast the world nickel price to rise significantly in 2000 to average US\$9,500 per tonne, largely due to its expectation that world consumption will exceed production. However, it did express concern that the nickel price could demonstrate volatility during 2000 due to supply-side factors such as the ready availability of scrap stainless steel, in addition to a larger than expected increase in production from new and/or existing producers.

In 2000-01, Western Australia's nickel production is forecast to rise significantly providing the three laterite projects produce close to full capacity. In addition, Tectonic Resources announced in the second



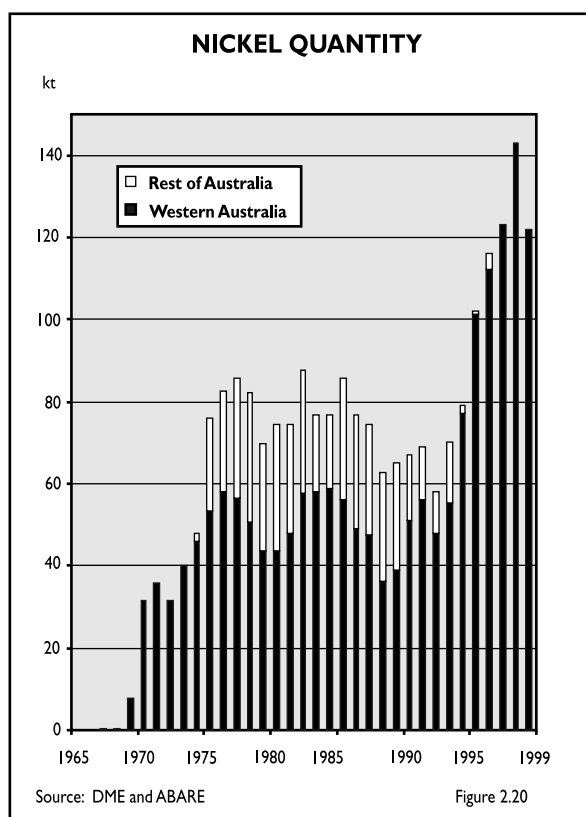
half of 1999 that it would develop the RAV 8 nickel deposit, located near Ravensthorpe. Mining commenced in April 2000 with the expectation that RAV 8 would produce approximately 8,700 tonnes of contained nickel metal annually over a two-year mine life. In addition, after giving the formal go-ahead in October 1999, Jubilee Gold Mines expect its \$38-million Cosmos nickel project, near Leinster, to be commissioned in the second quarter of 2000. Jubilee has an agreement to supply Inco Limited of Canada with approximately 10,000 tonnes of contained nickel in concentrate form annually. With the initial open-cut operation, the mine-life was expected to be around three years. However, following the delineation of additional reserves in early 2000, there is the possibility for an underground operation to also be developed at Cosmos.

WMC announced in August 2000 that it would spend \$9 million upgrading its Kwinana nickel refinery. The upgrade, which is largely aimed at removing bottlenecks in the production process, will give the plant the capacity to produce an extra 6,000 tonnes of nickel metal annually, taking the total annual production capacity of the refinery to 67,000 tonnes. This move will allow the company to process a higher proportion of its nickel matte, from the Kalgoorlie

refinery, to nickel metal, thereby increasing its profit margin. The expansion is expected to be completed by July 2001, however there is the possibility that production capacity could be further increased to 70,000 tonnes annually.

In other news, at the time of writing (20 September 2000) LionOre Australia (Nickel) Limited was expected to be within weeks of giving the formal go-ahead for the development of the \$42-million Emily Ann sulphide project near Norseman. In April 2000 the company announced that it had negotiated a long-term off-take agreement with Canada's Inco Limited for the sale of nickel concentrate from the project. In addition, a \$25-million limited recourse financing facility had been negotiated with Inco. The deposit is expected to be an underground operation capable of producing 6,700 tonnes of contained nickel metal annually.

In the longer term, the State's production will be further boosted if the proposed expansions of the three laterite projects and the development of additional new mines proceed, such as Comet Resources' Ravensthorpe and Anaconda's Mount Margaret laterite projects.



2.7 Heavy Mineral Sands

In 1999-00, the value of sales for the State's heavy mineral sands industry increased by nearly 8% to around \$732 million.

Around 73%, or \$537 million worth, of the State's mineral sands were exported in 1999-00. The State's predominant export markets were the USA (26%), the Netherlands (14%), Japan (12%), Taiwan (8%), the UK (6%), China (6%) and Spain (5%).

Latest comparable figures indicate that Western Australia accounts for approximately 86% (by value) of Australia's mineral sands production.

1999-00 Heavy Mineral Sands Industry Highlights

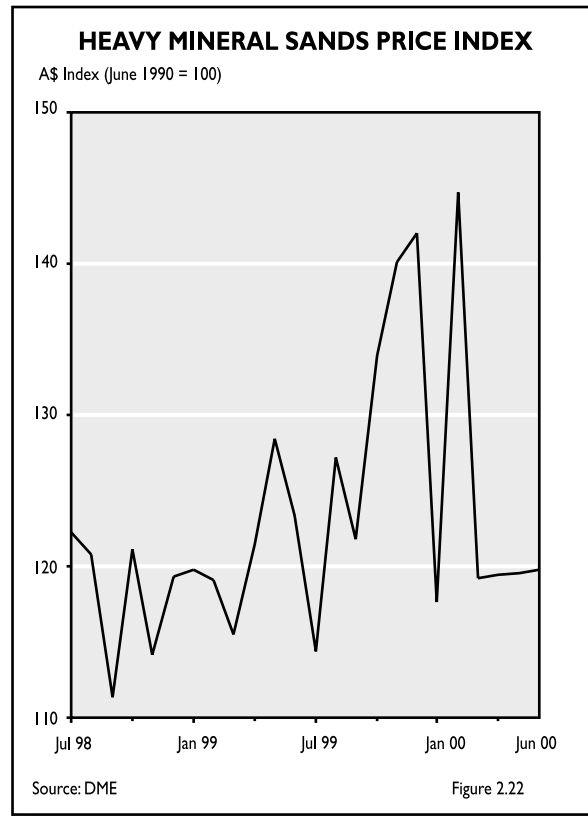
In 1999-00, the world market for heavy mineral sands was relatively upbeat. In Europe and USA in particular, despite continuing growth in their economies, demand for mineral sands products at the beginning of 1999-00 remained relatively static whilst Asian demand fell.

Japanese pigment producers faced a slump in the construction, engineering and automobile production sectors, which reduced demand. However, by the end of 1999 and into 2000, demand for titanium dioxide pigments strengthened in the Asian region whilst in Europe and the USA the market remained tight.

The performance of the State's mineral sands industry sector was relatively mixed in 1999-00. The largest sector (by value) of the State's mineral sands industry is upgraded ilmenite (synthetic rutile). In 1999-00, sales quantities of upgraded ilmenite dropped by 29% to approximately 554,000 tonnes. This was primarily due to a drop in sales from Iluka Resources' Capel and TiWest's Cooljarloo projects. However, due to much stronger prices, the value of sales increased by nearly 19% to \$327 million.

The quantity of ilmenite sold in 1999-00 declined by around 11% to just under 1.2 million tonnes due to a drop in sales from all projects, with the exception of Iluka Resources' Capel project. The associated sales value dropped by nearly 4% to around \$153 million. This was due to average ilmenite prices received (in Australian dollar terms) rising by 9% in 1999-00.

In 1999-00, zircon sales quantities increased by nearly 21% to around 343,000 tonnes. This was due to increases in sales from Iluka's Eneabba and Capel projects in addition to TiWest's Cooljarloo project. However, the value increased by only 11% to \$151 million in response to an approximate 8% drop in average prices received in 1999-00.

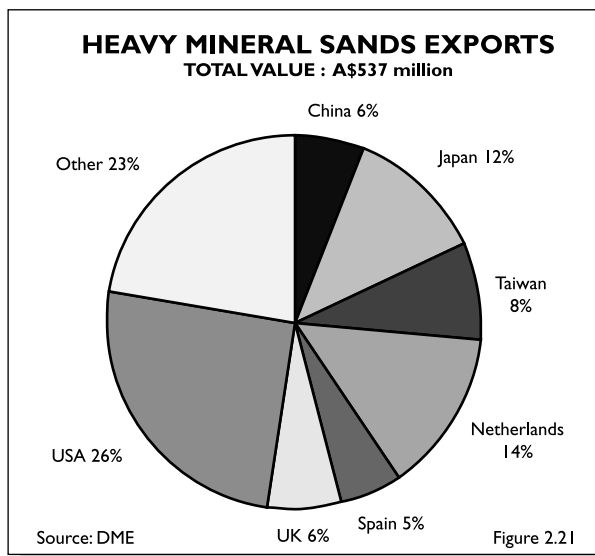


The rutile sector contracted in 1999-00, with the sales quantity dropping by 18% to around 98,000 tonnes as a result of a decrease in sales from Iluka Resources' Eneabba operation. Due to slightly weaker rutile prices received, the sales value dropped by 20% to just over \$72 million.

Leucoxene sales were up by 123% to just over 39,000 tonnes due to increases from all Western Australian producers. The sales value increased by a less than proportionate 101% due to average leucoxene prices received decreasing in 1999-00.

The value of garnet sales in 1999-00 increased by approximately 10% to just over \$12 million with the corresponding quantity increasing by 17% to around 104,000 tonnes. The average price received by garnet producers was down by 6% in 1999-00.

In August 1999, Iluka Resources (formed in December 1998 by the merger of RGC and Westralian Sands), announced it would bring forward the closure of RGC's South Capel mine and synthetic rutile plant from mid-2000 to October 1999. The closure was primarily due to depleted reserves and deterioration of the plant. The company decided against upgrading the synthetic rutile plant due to the fact that

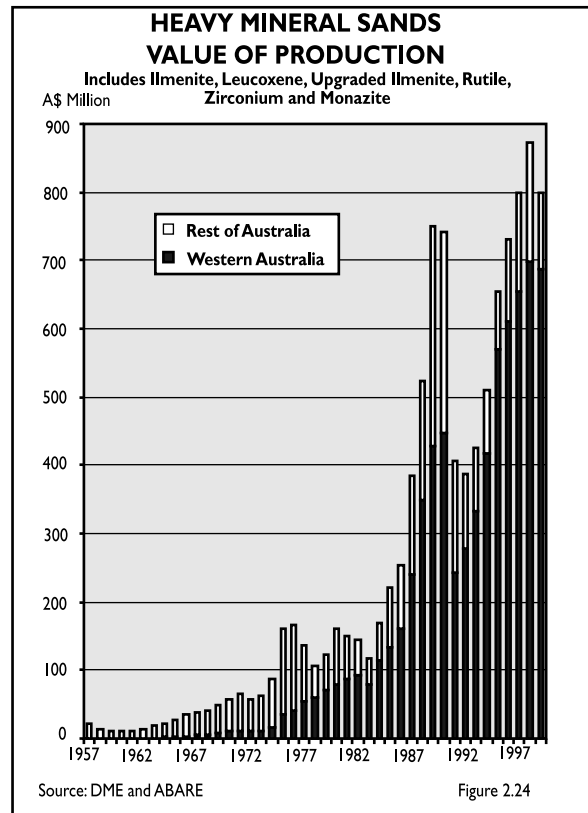


production could be maintained using Westralian Sands' more efficient plant next door in addition to the Narngulu plant near Geraldton. Iluka also announced plans in September 1999 to spend \$30 million to upgrade its Eneabba operations. This will involve the phasing-out of its high-cost dredge mining operations at Eneabba West in favour of using open-pit mining at its southern leases, and later mining at Pharaoh's Flats, north of Eneabba.

Outlook

The demand for titanium minerals is derived from its usage as a pigment in the colouring of paints and plastics. Overall, world pigment consumption is driven by demand from the major developed economies of the United States and Europe, and Asia to a lesser extent. Therefore, given the strong economic outlook for most of these economies, it is expected that demand for titanium minerals will be robust. Titanium feedstock prices are expected to increase largely as a result of pigment plants worldwide running at close to full capacity.

In 2000-01, ABARE (June 2000) anticipates that the price of ilmenite will continue to increase due to the maintenance of strong demand. Worldwide supply is

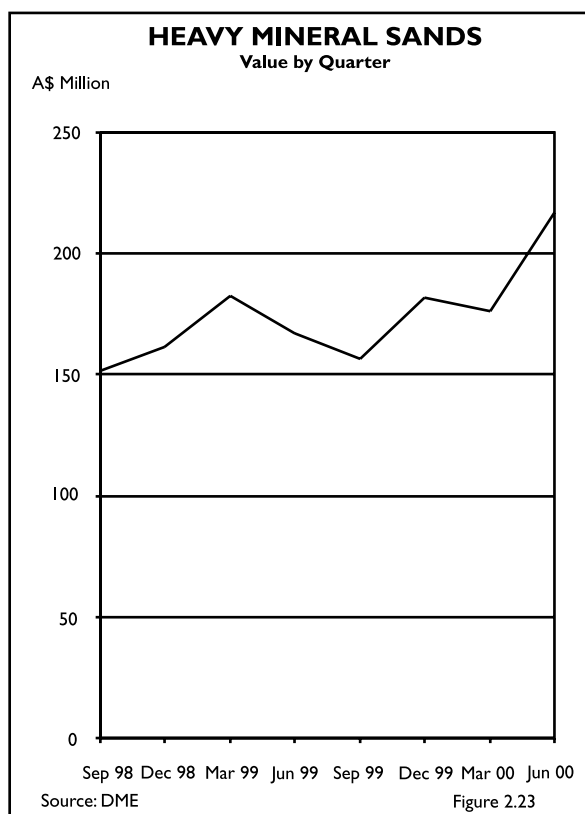


forecast to remain tight until around 2003 when new production capacity is expected to come on line. ABARE has in turn forecast average Australian export ilmenite prices to average \$140 per tonne in 2000-01, up by nearly 9% on 1999-00.

According to ABARE, the price of rutile is being capped by competition from titanium slag and synthetic rutile, nevertheless demand is still considered to be increasing. ABARE has forecast Australian export prices for rutile to average \$755 per tonne in 2000-01, up slightly (by 1%) on 1999-00.

Demand for zircon is anticipated to show continued growth over the near term due largely to an expansion in industrial production in Asia coupled with continued economic growth in Europe and the US. However, any upside in price has been dampened somewhat by an increase in world zircon production. ABARE has forecast Australian export prices for zircon to average \$503 per tonne in 2000-01, up by 6% on 1999-00.

ABARE also anticipate that average Australian synthetic rutile and leucoxene export prices will strengthen over the near term. ABARE has forecast a synthetic



rutile price of \$617 per tonne in 2000-01, up by nearly 2% on 1999-00. The Australian leucosene export price is expected to average \$476 in 2000-01, after increasing by around 18% in 1999-00.

There are a number of potential new mineral sands projects currently under consideration in Western Australia. These include Cable Sands' Jangardup South mine, the expansion of Millennium Inorganic Chemicals' titanium dioxide pigment plant at Kemerton and Tiwest's Kwinana pigment plant expansion. A decision to proceed on any of these developments is dependent on a continuation and/or improvement in prevailing market conditions.

2.8 OTHER MINERALS

Base Metals

The value of base metal sales (copper, lead and zinc) increased by 43% to \$332 million in 1999-00 and follows a 23% increase in value of sales in 1998-99. This increase was due to both larger quantities and stronger copper and zinc prices.

In 1999-00 zinc remained the dominant contributor to total base metals value of sales, increasing by 47% to \$251 million. This followed a 46% increase in value of sales to \$171 million in 1998-99.

Zinc production in Western Australia comes from two main sources, Normandy's Golden Grove and Western Metals' Lennard Shelf mining operations, both of which significantly increased output in 1999-00.

The copper sector recovered strongly in terms of both price and quantity over 1999-00 following a lacklustre performance in 1998-99 when quantity and value of sales declined by 17% and 28% respectively. In 1999-00 the quantity increased 20% and the value of sales was up 40% on 1998-99 to \$61 million reflecting higher world prices. The increase in copper sales in 1999-00 is predominately the result of the expansion of Straits Resources' Nifty project. Straits Resources announced in late December 1999 that it would spend \$16 million expanding copper production at its Nifty project from 16,500 to 25,000 tonnes annually. The expansion is expected to be completed in October 2000.

The quantity of lead sales in 1999-00 was up 29% from 1998-99 to 64,460 tonnes following a significant 84% increase in 1998-99. Lead prices declined significantly in the second half of 1999-00 and the value of sales in 1999-00 increased 17% to just over \$20 million.

Coal

In 1999-00 the quantity of coal sold by the State's two coal producers, Wesfarmers and Griffin, increased by just over 12% with an associated increase in value of 6% to \$272 million. This performance represents a marked improvement on 1998-99 when the increase in quantity sold was only 1% and the value of sales actually declined by 0.2%. The growth in sales in 1999-00 is mainly attributed to an increase in coal supplied by Wesfarmers under contract to Western Power.

Diamonds

In 1999-00 the value of diamond sales rose by 15% to \$704 million, breaking the previous year's record. This result was achieved despite a 0.5% drop in sales volume to 51 million carats.

The Argyle joint venture project (partners Rio Tinto, 60%, and Ashton Mining, 40%), the State's sole diamond producer, fared well over the last two years compared with the slump experienced in most parts of the gem market due to weak sales in Asia. Low-value diamonds dominate the Argyle project's production and the economic downturn in Asia increased demand for these diamonds by a "trade down" in the traditionally higher value markets of Japan and other parts of Asia. In addition, Argyle has successfully focused its marketing strategy on the lower value jewellery producers in India and generated a strong market for these gems.

Argyle's diamond marketing has been independent of De Beers' London-based Central Selling Organisation since 1996. However, if De Beers is successful in its take-over bid for Ashton Mining this may be threatened. At the time of writing Rio Tinto has made a counter-offer for the Ashton shares.

In November 1999, Ashton Mining announced that it would re-examine the potential for an underground mine at Argyle after discovering an extension of the AK1 diamond pipe to the south of the existing orebody. Indications at this stage are that the new

resource could sustain diamond production beyond 2006, when open-pit mining is scheduled to cease.

Gypsum

The quantity of Western Australian gypsum sold increased by a modest 4% in 1999-00 to just over 1.3 million tonnes valued at \$23 million. This follows impressive increases in quantities sold and value of sales - 51% and 52% - respectively in 1998-99. The rise in quantity was accounted for by increased shipments from the new Dampier Salt gypsum operation at Lake MacLeod (68% owned by Rio Tinto), Australia's largest gypsum producer.

Manganese

In May 1999, the State's sole manganese operation, Consolidated Minerals' Woodie Woodie project in the Pilbara, recommenced production after being closed since early 1997. This accounts for the large increase in quantity and value of sales in 1999-00. Consolidated Minerals expect to produce 250,000 tonnes of manganese annually and has around 90% of output sold under contracts to Japan, China and Europe.

Salt

In 1999-00 the quantity of salt sold increased by 3% to 8.8 million tonnes. However, the average price per tonne declined by 9% resulting in a 7% fall in the value of sales to \$185 million. This decline in value is a turnaround from the 6% growth in value attained in 1998-99.

Tantalum and Spodumene

In 1999-00 sales of tantalum increased by 24% to 514 tonnes with a market value of just under \$78 million, up 19% on 1998-99. This follows a 57% increase in value of sales in 1998-99 reflecting the significant increase in prices over that period. At present Sons of Gwalia Ltd (SOG) is the sole tantalum producer in this State and is the largest in the world, supplying 50% of all tantalum from primary sources and 25% when other sources of supply, such as recycling and slag treatment are included. SOG currently produces from its Greenbushes and Wodgina mines. Greenbushes is the world's biggest hard rock tantalum mine. SOG has recently announced record tantalum sales during the March 2000 quarter, a 66% increase in its tantalum reserves and plans for major expansions of both the Greenbushes and Wodgina mines.

Spodumene sales, also sourced from Greenbushes, increased by just under 30% to around 62,000 tonnes in 1999-00 with a market value of more than \$14 million.

Vanadium

In 1999-00 the quantity of vanadium pentoxide sold was 757 tonnes with a value of just under \$5 million. After commencing construction in November 1998, Precious Metals Australia (PMA) and its joint venture partner, Xstrata AG of Switzerland, commissioned their \$121-million vanadium project at Windimurra, near Mt Magnet, in October 1999. The first shipment of vanadium pentoxide occurred in February 2000 with the expectation that the mine's production will supply markets in Japan, Europe and the United States. The operation has the capacity to produce 7,200 tonnes per annum of vanadium pentoxide or around 12% of world production. Windimurra is Australia's only operating vanadium project.

Outlook for 2000-01

ABARE forecasts average world copper and zinc prices to rise and lead prices to fall in 2000-01. Average world copper prices are forecast to rise as world copper consumption firms with stronger demand in China and Western Europe. The world zinc price is forecast to rise in 2000 but is expected to ease in 2001 as world consumption growth moderates and supply continues to grow. The forecasts for world lead price trends are in the opposite direction from those for zinc - i.e. world lead prices to fall in 2000 then rise in 2001 - as growth in world production moderates.

3. EXPLORATION, INVESTMENT AND EMPLOYMENT

Mineral Exploration

The mineral exploration figures released by the Australian Bureau of Statistics (ABS) indicate that expenditure for Western Australia fell to \$415 million in 1999-00, down by 21% on the 1998-99 level of \$523 million. In particular, Western Australian mineral exploration expenditure in the March quarter 2000 of \$85 million, was the lowest nominal quarterly expenditure since the March quarter 1993. This was attributed not only to the flow-on effects of low world commodity prices and lack of capital, but also unusual cyclonic weather and resultant flooding.

The overall result for 1999-00 is not surprising given the spate of record low commodity prices in 1998-99, as exploration expenditure is a lagging indicator of the general level of commodity prices. In addition, the fall should also be seen in the context of historically high levels of exploration expenditure over the previous three years, with a record of \$692 million attained in 1996-97, \$660 million in 1997-98, with the \$523 million recorded in 1998-99 comparable to that of 1995-96.

Western Australia accounted for around 62% of total Australian mineral exploration expenditure of \$838 million in 1999-00, also attracting the same proportion of Australian expenditure in 1998-99.

Depressed gold prices impacted on the State's exploration effort in the sector with expenditure falling by 23% to \$253 million in 1999-00. It was therefore the dominant factor behind the overall fall in the State's exploration expenditure. Gold accounted for 61% of Western Australia's mineral exploration in 1999-00, down from 63% in 1998-99. The State received 68% of Australia's total gold exploration funds, the same as in 1998-99.

Exploration expenditure on base metals in Western Australia (by ABS definition - copper, silver-lead-zinc, nickel and cobalt), decreased by around 3% from \$91 million to \$88 million in 1999-00. The 1999-00 expenditure accounted for 56% of Australia's total base metals exploration, up from 51% in 1998-99. Most of this expenditure was on nickel prospects, with copper and silver-lead-zinc exploration believed to be stagnant or falling.

The State recorded iron ore exploration expenditure of \$14 million in 1999-00 however, this figure is not comparable to the 1998-99 figure of \$40 million, as the ABS published expenditure for only two quarters of the year. It is estimated that Western Australia would account for close to 100% of the \$30 million reported iron ore exploration expenditure for Australia in 1999-00.

State diamond exploration expenditure in 1999-00 totalled \$25 million, down by 25% from the 1998-99 level of \$33 million. Western Australia accounted for around 83% of Australia's total diamond exploration funds, up from 80% in 1998-99. Activity was mainly centred in the Kimberley region.

Western Australia recorded heavy mineral sands exploration expenditure of \$6 million in 1999-00, however this is not comparable to the 1998-99 expenditure of \$9 million due to the ABS only publishing figures for three quarters of the year. In 1998-99, the State accounted for 46% of total Australian expenditure for heavy mineral sands, with the 1999-00 proportion likely to be close to this.

The State's mineral sands exploration effort may be hindered in the near term as expenditure is directed to other areas perceived as having greater prospectivity. During the year there were predictions that the Murray Basin (which straddles New South Wales, South Australia and Victoria), currently undergoing extensive exploration, particularly in Victoria and New South Wales, could overtake Western Australia as the nation's largest producer of mineral sands in the next ten years. This was in light of several recent discoveries of high-grade heavy mineral sands deposits located near the surface that allow for low-cost mining and processing. It was initially thought that the distance involved in transporting low-value ilmenite from the Murray Basin to the nearest port would make the development of such deposits uneconomic. However, the Murray Basin deposits have tended to have higher proportions of rutile and zircon, thus giving them a higher value and compensating somewhat for the extra distance involved in getting them to port.

NOTE: More in-depth information on mineral exploration in Western Australia can be found in the Geological Survey of Western Australia's Annual Review.

Petroleum Exploration

According to the ABS, the State's petroleum exploration expenditure in 1999 decreased by 20% to \$425 million, compared to \$531 million in 1998-99. National expenditure dropped by 19% from \$868 million in 1998-99 to \$704 million in 1999-00. Western Australia's share of Australia's petroleum exploration expenditure dropped from 61% in 1998-99 to 60% in 1999-00. The amount quoted includes expenditure on Western Australian leases located within Area B of the Zone of Cooperation with East Timor.

Other indicators of petroleum exploration activity in the State, namely seismic surveys (both 2D and 3D) in addition to the amount of drilling undertaken, tend to indicate that although petroleum exploration expenditure has dropped, actual exploration activity is still taking place at near record levels. This in turn suggests that the industry has made productivity gains in exploration which have resulted in lower costs.

The State's petroleum exploration activity in 1999-00, was concentrated in the Carnarvon, Perth, Canning, Bonaparte and Browse Basins.

In terms of the national total, 21% of exploration expenditure was devoted to production leases in 1999-00, up from 12% in 1998-99. The remaining expenditure went towards exploration and/or retention permit areas. ABS data also shows that Australia-wide, 84% of exploration expenditure was directed to offshore areas in 1999-00, compared to 79% in the previous year.

NOTE: More in-depth information on petroleum exploration in Western Australia can be found in the Department of Minerals and Energy's, Petroleum Division publication, *Petroleum in Western Australia*.

Mining Investment

ABS private new capital expenditure statistics for 1999-00 indicate that mining accounted for 43% of Western Australia's total investment, compared to 52% in 1998-99. Total State investment decreased by 24% from the 1998-99 level of \$6.98 billion to \$5.28 billion in 1999-00. The actual level of mining investment in

Western Australia was \$2.28 billion in 1999, down by 38% on the 1998-99 amount of \$3.65 billion.

In 1999-00, Western Australia accounted for 43% of national mining investment of \$5.29 billion. This compares to the 1998-99 outcome when Western Australia accounted for 42% of Australia's mining investment of \$8.72 billion.

ABS mining investment figures, however, need to be treated cautiously as they do not capture all mining investment. The ABS utilise classifications according to those 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 coals and ores, liquids such as crude petroleum or gases such as 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 by ANZSIC. In addition, products of mineral origin, e.g. coke and alumina are included in manufacturing although these operations are dependent on mining outputs. A breakdown of the manufacturing investment figures into resource processing and other categories is not available.

Mining Employment

The Department of Minerals and Energy's employment statistics are compiled from monthly industry returns supplied for the purpose of monitoring the number and nature of workplace accidents. The employment figures published reflect the number of workers on the mine-site at any point in time, including contract workers.

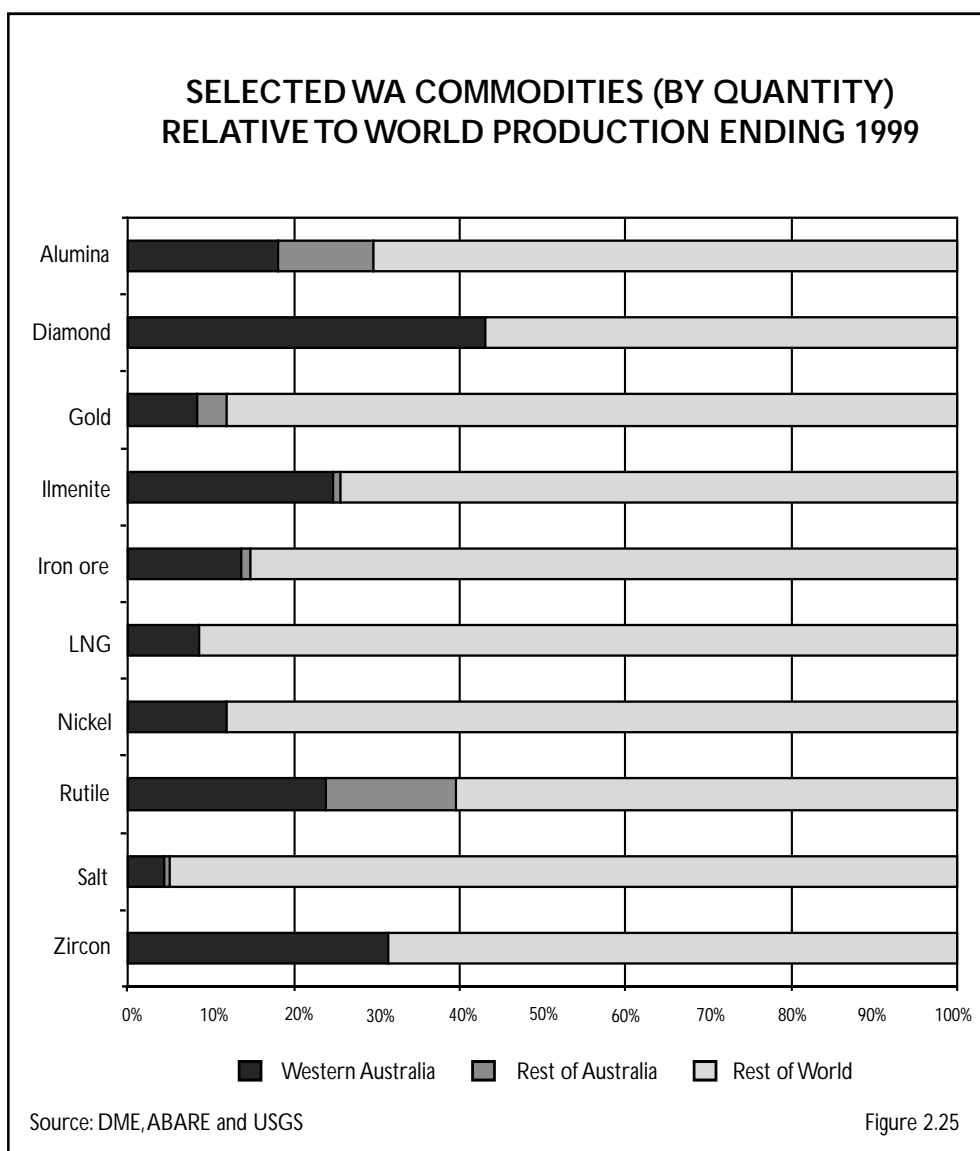
In 1999-00, employment in the State's mineral and petroleum industries decreased by 9% to 40,334 persons. Please note however that the statistics provided are estimates only.

Of the major sectors to record increases, employment rose by nearly 10% in the salt sector due to an expansion of Dampier Salt's operations, in addition to the construction/commissioning of the Onslow salt project by Onslow Solar Salt. An increase of 8% was recorded in the base metals sector due to the expansion of the Straits Resources' Nifty copper project. Employment also rose by 6% in the bauxite-

alumina industry due mainly to the finalisation of the expansion of the Worsley alumina refinery.

Decreases in employment were recorded in the nickel sector, down by 23% due mainly to the completion of the Murrin Murrin plant, i.e. the construction workforce was greater than the operational workforce. A drop of 21% was also recorded in the coal sector as a result of Wesfarmers Coal's continuing drive to

rationalise pits and the introduction of new coal-handling equipment. Employment decreased by 14% in the iron ore sector due to cuts in staff numbers across many of BHP's operations. A 13% decline in employment was recorded in the heavy mineral sands sector due largely to rationalisation resulting from the merger of RGC and Westralian Sands to create Iluka Resources. Employment in the petroleum sector also fell slightly by 3%.



The latest comparable data shows that the Western Australian share (by quantity) of the world's output of the following products was: alumina 18%, diamond production (mainly industrial grade) 43%, gold 8%, ilmenite 25%, iron ore 14%, LNG (World Trade) 9%, nickel 12%, rutile 24%, salt 4%, and zircon 31%.

TABLE 1 QUANTITY AND VALUE OF MINERALS AND PETROLEUM

COMMODITY/Mineral	UNIT	1998-99		1999-00	
		QUANTITY	VALUE (A\$)	QUANTITY	VALUE (A\$)
BASE METALS					
Copper Metal	t	24,436 (r)	43,712,911 (r)	29,391	61,120,054
Lead Metal	t	51,553	17,253,220	64,465	20,242,917
Zinc Metal	t	194,900	170,726,483 (r)	232,585	251,013,207
TOTAL BASE METALS			231,692,613 (r)		332,376,178
BAUXITE-ALUMINA					
Alumina	t	8,864,125	2,367,032,747	9,354,252	2,657,894,317
CHROMITE					
Chromite	t	30,052	6,528,156	17,547	3,249,086
CLAYS					
Attapulgit	t	11,688	1,220,812	11,513	1,202,424
Clay Shale	t	10,190	101,900	28,478	284,780
Fire Clay	t	74,032	88,838	98,706	118,448
Kaolin	t	1,776	216,398	2,478	206,974
Saponite	t	0	0	358	24,970
TOTAL CLAYS			1,627,948		1,837,596
COAL	t	5,796,622	256,742,210 (r)	6,504,506	271,531,464
CONSTRUCTION MATERIALS					
Aggregate	t	277,486	2,271,690	258,512	1,991,911
Gravel	t	254,165 (r)	1,668,738 (r)	206,447	1,330,518
Rock	t	310,114 (r)	2,090,288 (r)	221,596	1,551,019
Sand	t	1,934,438 (r)	8,754,554 (r)	1,469,448	6,867,615
TOTAL CONSTRUCTION MATERIALS			14,785,270 (r)		11,741,063
DIAMOND	ct	51,230,582	610,435,064	50,984,633	703,669,937
DIMENSION STONE					
Granite	t	5,177 (r)	950,000 (r)	2,771	556,580
Jasper	t	984 (r)	594,880 (r)	0	0
TOTAL DIMENSION STONE			1,544,880 (r)		556,580
GEM & SEMI-PRECIOUS STONE					
Agate	kg	0	0	7,186	4,312
Chrysoprase	kg	0	0	178	4,369
Emerald	kg	0	0	0.004	10,420
Jasper	kg	0	0	20,748	16,045
Variscite	kg	0	0	100	60,054
TOTAL GEM & SEMI-PRECIOUS STONE			0		95,200
GOLD	kg	219,258 (r)	3,219,516,924 (r)	203,853	2,935,573,029 (e)
GYPSUM	t	1,261,538 (r)	21,767,354 (r)	1,307,013	23,049,576
HEAVY MINERAL SANDS					
Garnet	t	88,580	11,313,352	103,815	12,471,320
Ilmenite	t	1,319,856	158,587,045	1,168,450	152,527,268
Upgraded Ilmenite	t	784,640 (r)	275,230,270 (r)	914,334	326,714,707
Leucoxene	t	17,513	8,130,865	39,064	16,377,390
Rutile	t	119,709	90,971,056	98,112	72,451,132
Zircon	t	284,533	136,065,790	343,128	151,281,644
TOTAL HEAVY MINERAL SANDS			680,298,378 (r)		731,823,461

TABLE 1 (Cont.) QUANTITY AND VALUE OF MINERALS AND PETROLEUM

COMMODITY/Mineral	UNIT	1998-99		1999-00	
		QUANTITY	VALUE (A\$)	QUANTITY	VALUE (A\$)
INDUSTRIAL PEGMATITE MINERALS					
Feldspar	t	23,694 (r)	907,504 (r)	42,998	1,649,003
IRON ORE					
Domestic	t	7,144,618	207,872,396	6,037,470	154,209,360
Exported	t	133,882,496 (r)	3,690,655,347 (r)	145,120,688	3,567,914,626
TOTAL IRON ORE		141,027,114 (r)	3,898,527,743 (r)	151,158,158	3,722,123,986
LIMESAND-LIMESTONE-DOLOMITE					
Dolomite	t	3,086	67,892	2,932	64,504
Limesand-Limestone	t	3,046,105	13,867,322	2,945,525	13,585,856
TOTAL LIMESAND-LIMESTONE-DOLOMITE			13,935,214		13,650,360
MANGANESE ORE	t	27,414	3,415,875	212,382	25,684,859
NICKEL INDUSTRY					
Cobalt by-product	t	1,092	55,266,894	1,580	56,652,989
Nickel Concentrate	t	835,160	872,398,146	871,262	1,613,510,235
Nickel Metal	t	519 (r)	4,220,297 (r)	13,253	155,086,285
Palladium by-product	kg	792	9,233,230	861	16,511,549
Platinum by-product	kg	102	1,838,767	119	2,347,128
TOTAL NICKEL INDUSTRY			942,957,333 (r)		1,844,108,186
PETROLEUM					
Condensate	kl	5,554,129	743,906,225	6,347,648	1,583,938,449
Crude Oil	kl	9,162,536	1,189,643,508 (r)	12,054,819	3,179,267,324
LNG	Btu 10 ⁶	391,897,317	1,434,419,363	393,613,100	1,971,060,425
LPG - Butane	t	388,694	90,621,537	443,576	190,900,705
LPG - Propane	t	259,207	57,626,639	334,573	145,937,645
Natural Gas	'000m ³	6,439,699	549,830,769	6,546,244	578,766,829
TOTAL PETROLEUM			4,066,048,040 (r)		7,649,871,377
PIGMENTS					
Red Oxide	t	331	62,890	0	0
SALT	t	8,570,782	199,638,214	8,809,769	185,012,401
SILICA-SILICA SAND					
Silica	t	90,069	900,692	97,687	976,872
Silica Sand	t	519,518 (r)	5,489,158 (r)	390,919	4,581,721
TOTAL SILICA-SILICA SAND			6,389,850 (r)		5,558,593
SILVER	kg	66,410 (r)	14,588,953 (r)	109,443	27,000,040
SPONGOLITE	t	8,180	654,375	9,915	1,909,370
TALC	t	182,838 (r)	14,665,992 (r)	169,135	13,569,779
TIN-TANTALUM-LITHIUM					
Spodumene	t	48,021	10,886,637	62,116	14,448,602
Tantalite	t	415	65,929,047	514	78,670,971
Tin Metal	t	596	4,999,060	576	4,756,778
TOTAL TIN-TANTALUM-LITHIUM			81,814,744		97,876,351
VANADIUM	t	0	0	757	4,986,776
TOTAL VALUE			16,655,578,273 (r)		21,266,398,568

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.

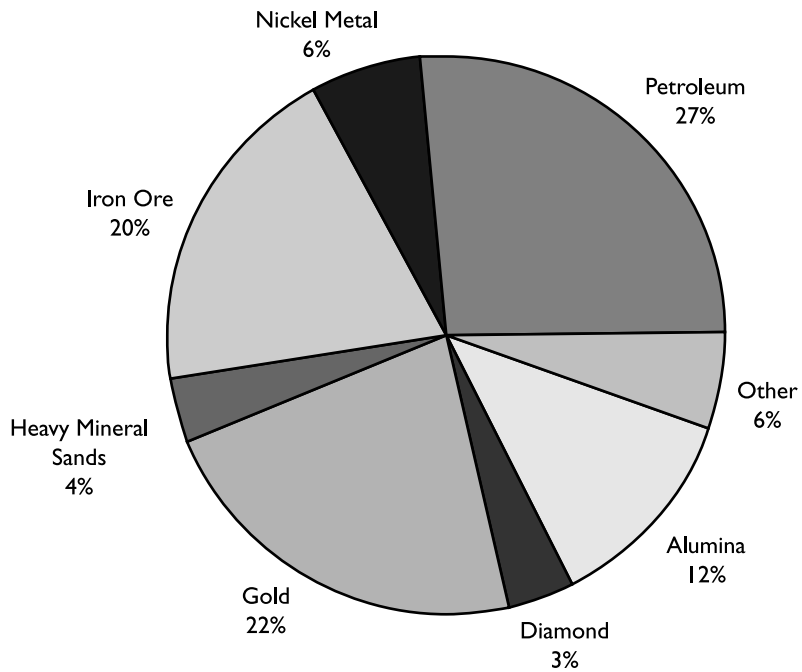
TABLE 2 QUANTITY AND VALUE OF SELECTED MAJOR COMMODITIES

	Unit	1990-91		1991-92		1992-93		1993-94	
		Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M
ALUMINA	Mt	6.80	2,099.13	7.13	1,758.15	7.55	1,818.12	7.83	1,784.32
BASE METALS									
Copper Metal	kt	12.00	20.35	12.02	17.44	22.92	27.44	32.46	40.26
Lead Metal	kt	12.48	5.99	21.68	7.30	22.30	6.65	21.11	4.98
Zinc Metal	kt	75.20	76.39	142.92	125.58	127.96	104.11	136.39	79.54
TOTAL BASE METALS			102.73		150.32		138.20		124.78
COAL	Mt	5.22	232.92	5.49	243.54	5.43	244.77	5.15	236.29
DIAMOND	M ct	29.96	435.73	47.49	564.77	24.83	519.98	28.86	476.75
GOLD	tonnes	181.17	2,762.82	182.04	2,689.92	179.80	2,834.19	193.60	3,415.06
HEAVY MINERAL SANDS									
Ilmenite	Mt	0.97	85.48	0.97	83.15	0.99	81.66	1.07	92.32
Rutile	kt	65.45	49.60	47.47	26.88	75.93	42.14	68.93	35.76
Upgraded Ilmenite	kt	266.00	133.01	375.00	188.19	396.00	184.67	402.00	185.84
Zircon	kt	208.42	100.80	226.93	61.11	302.46	49.19	349.13	63.10
Other HMS			20.45		12.04		10.29		13.92
TOTAL HEAVY MINERAL SANDS			389.34		371.37		367.95		390.94
IRON ORE	Mt	107.67	2,648.69	111.64	2,953.27	111.73	2,991.14	119.69	2,865.16
MANGANESE ORE	kt	160.32	25.59	395.30	71.86	251.53	46.89	315.79	42.01
NICKEL	kt	54.49	595.88	50.17	489.51	53.27	472.17	61.11	458.62
PETROLEUM									
Condensate	Gl	1.87	370.95	2.00	338.98	2.00	363.04	2.35	348.71
Crude oil	Gl	5.14	1,054.06	5.43	941.29	4.54	855.69	5.33	815.33
LNG	Btu 10 ¹²	184.93	836.40	219.70	846.33	254.47	1,025.06	296.36	1,015.68
LPG - Butane	kt	0	0	0	0	0	0	0	0
LPG - Propane	kt	0	0	0	0	0	0	0	0
Natural Gas	Gm ³	3.61	379.23	3.77	349.26	3.96	407.02	4.46	413.37
TOTAL PETROLEUM			2,640.64		2,475.86		2,650.81		2,593.09
SALT	Mt	6.41	136.97	6.93	153.14	6.63	158.38	6.16	149.18
OTHER			83.80		122.55		105.14		119.60
TOTAL			12,154.24		12,044.26		12,347.74		12,655.80

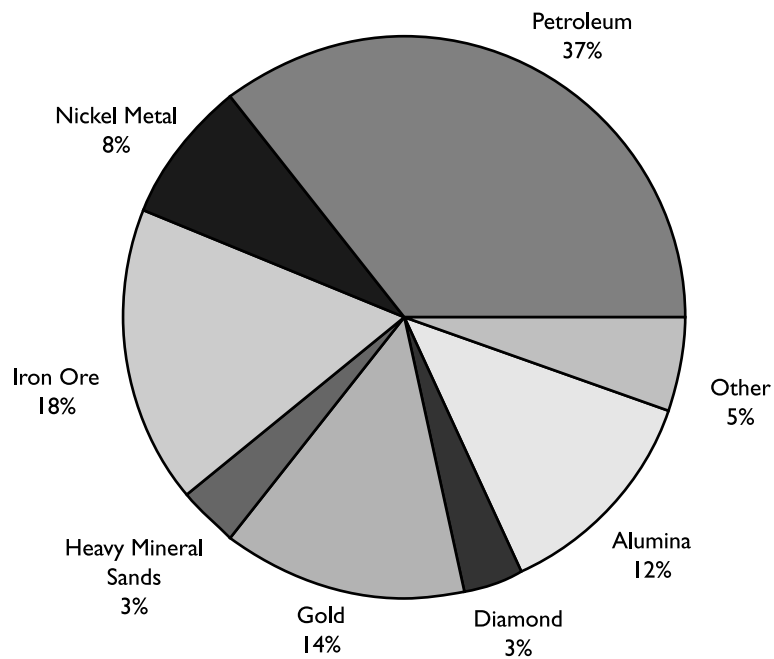
1999 - 2000 STATISTICS DIGEST

1994-95		1995-96		1996-97		1997-98		1998-99		1999-00	
Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M
7.91	1,684.60	8.23	1,918.34	8.35	1,955.77	8.51	2,260.54	8.86	2,367.03	9.35	2,657.89
29.20	76.54	23.69	65.42	27.73	58.98	29.43	61.12	24.44	43.71	29.39	61.12
21.10	9.20	21.28	12.64	13.49	6.09	27.00	10.45	51.55	17.25	64.47	20.24
132.85	95.84	113.49	75.32	88.37	75.12	124.00	117.11	194.90	170.73	232.59	251.01
	181.58		153.39		140.19		188.68		231.69		332.38
5.86	274.75	5.90	270.36	5.56	257.30	5.71	257.28	5.80	256.74	6.50	271.53
23.93	480.03	33.52	525.21	52.52	395.79	42.48	537.87	51.23	610.44	50.98	703.67
187.85	3,132.87	205.89	3,404.65	228.02	3,409.61	239.46	3,468.95	219.26	3,219.52	203.85	2,935.57
0.99	89.65	1.10	111.18	1.10	117.28	1.31	149.14	1.32	158.59	1.17	152.53
107.78	56.13	119.14	75.06	110.96	77.74	104.13	78.58	119.71	90.97	98.11	72.45
490.00	228.29	517.00	252.56	545.00	270.48	688.00	355.79	784.64	275.23	914.33	326.71
477.05	129.77	410.03	181.21	324.09	177.99	321.38	169.13	284.53	136.07	343.13	151.28
	14.56		18.50		26.51		24.63		19.44		28.85
	518.40		638.51		670.00		777.27		680.30		731.82
133.13	2,794.31	132.90	2,924.06	141.29	3,159.65	149.74	3,930.77	141.03	3,898.53	151.16	3,722.12
71.91	8.84	347.04	41.34	324.11	37.62	86.30	9.39	27.40	3.42	212.38	25.68
92.99	897.12	103.30	1,097.30	114.10	1,051.11	135.19	1,146.64	125.77	876.62	142.99	1,768.60
2.64	398.34	4.65	685.74	5.73	943.15	6.76	1,065.84	5.55	743.91	6.35	1,583.94
9.90	1,559.65	9.65	1,535.67	10.47	1,915.93	9.85	1,567.16	9.16	1,189.64	12.05	3,179.27
356.11	1,262.51	379.79	1,350.92	370.50	1,528.77	379.54	1,591.94	391.90	1,434.42	393.61	1,971.06
0	0	100.24	22.71	209.69	59.67	376.09	90.47	388.69	90.62	443.58	190.90
0	0	87.02	19.73	185.74	55.66	263.26	61.26	259.21	57.63	334.57	145.94
5.37	445.71	6.31	454.76	6.89	534.65	6.88	557.47	6.44	549.83	6.55	578.76
	3,666.21		4,069.53		5,037.83		4,934.14		4,066.65		7,649.87
7.18	155.14	7.45	154.22	7.55	153.62	8.19	188.70	8.57	199.64	8.81	185.01
	164.52		192.44		192.18		234.85		245.00		282.26
13,958.37		15,389.35		16,460.67		17,935.08		16,655.58		21,266.40	

5 YEAR VALUE COMPARISON
1994-95 Total : A\$13.96 billion



1999-00 Total : A\$21.27 billion



Source: DME

Figure 0.1

TABLE 3 QUANTITY & VALUE OF MINERALS & PETROLEUM BY LOCAL GOVERNMENT AREA

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE AS (p.55)	Ref.
BASE METALS					
			Cu tonnes		
Copper By-Product	Coolgardie		4,977	7,708,184	(a)
	Roebourne		1,133	1,528,396	(a),(b)
Total Copper By-Product			6,110	9,236,580	
			Cu %		
Copper Concentrates	East Pilbara	10,595	20.07	3,915,995	
	Yalgoo	15,690	19.93	1,659,415	
Total Copper Concentrates		26,285		5,575,410	(a)
			Cu tonnes		
Copper Cathode	East Pilbara		18,027	46,308,064	
Total Copper				61,120,054	(a),(b)
			Pb %		
Lead	Derby-West Kimberley	88,677	71.38	19,394,880	
	Yalgoo	5,180	22.61	848,037	
Total Lead		93,857		20,242,917	(a)
			Zn %		
Zinc	Derby-West Kimberley	270,599	50.83	157,607,968	
	Yalgoo	186,148	51.06	93,405,239	
Total Zinc		456,747		251,013,207	(a)
TOTAL BASE METALS				332,376,178	
BAUXITE - ALUMINA					
Alumina	Murray	5,217,628		1,463,199,077	
	Serpentine-Jarrahdale	1,980,302		571,692,923	
	Warooka	2,156,322		623,002,317	
TOTAL BAUXITE - ALUMINA		9,354,252		2,657,894,317	(c),(d)
CHROMITE					
Chromite Ore	Meekatharra	46,046	Cr ₂ O ₃ % 38.11	3,249,086	(a)
CLAY					
Attapulgite	Mullewa	11,513		1,202,424	
Clay Shale	Collie	28,478		284,780	
Fire Clay	Chittering	98,706		118,448	
Kaolin	Bridgetown-Greenbushes	2,478		206,974	
Saponite	Coorow	358		24,970	
TOTAL CLAY		141,175		1,837,596	(e)
COAL	Collie	6,504,506		271,531,464	(f)
CONSTRUCTION MATERIALS					
Aggregate	Broome	16,670		565,436	
	Port Hedland Town	1,990		11,942	
	Roebourne	207,220		1,226,980	
	Wyndham-East Kimberley	32,632		187,553	
Total Aggregate		258,512		1,991,911	

TABLE 3 (cont.) QUANTITY & VALUE OF MINERALS & PETROLEUM BY LOCAL GOVERNMENT AREA

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE AS (p.55)	Ref.
Gravel	Broome	5,553		29,890	
	Coolgardie	39,505		236,345	
	Coorow	273		1,638	
	East Pilbara	10,210		51,050	
	Kalamunda	122,543		847,969	
	Kalgoorlie-Boulder	20,337		111,851	
	Port Hedland Town	773		6,887	
	Wyndham-East Kimberley	7,254		44,888	
Total Gravel		206,447		1,330,518	
Rock	Broome	5,163		253,596	
	East Pilbara	14,974		89,847	
	Kalgoorlie-Boulder	200,281		1,201,688	
	Wyndham-East Kimberley	1,178		5,888	
Total Rock		221,596		1,551,019	
Sand	Broome	36,242		360,554	
	Collie	516		3,098	
	Coolgardie	263,632		1,556,107	
	Coorow	2,359		11,795	
	Dandaragan	1,800		10,725	
	Derby-West Kimberley	13,407		79,750	
	Kalgoorlie-Boulder	8,151		48,907	
	Northam	74,139		222,417	
	Port Hedland Town	23,236		151,004	
	Roebourne	12,449		77,955	
	Wanneroo	1,024,567		4,300,554	
	Wyndham-East Kimberley	6,366		31,834	
	Yilgarn	2,583		12,915	
Total Sand		1,469,448		6,867,615	
TOTAL CONSTRUCTION MATERIAL		2,156,004		11,741,063	(e)
DIAMOND			carats		
	Wyndham-East Kimberley	50,984,633		703,669,937	(a)
DIMENSION STONE					
Granite	Coolgardie	287		59,700	
	Dundas	2,300		487,680	
	Roebourne	184		9,200	
TOTAL DIMENSION STONE		2,771		556,580	(e)
GEM & SEMI-PRECIOUS STONE					
			kg		
Agate	Marble Bar	7,186		4,312	
Chrysoprase	Kalgoorlie-Boulder	178		4,369	
Emerald	Mt Magnet	0.004		10,420	
Jasper	Ashburton	3,058		5,431	
	Marble Bar	620		372	
	Meekatharra	17,070		10,242	
Total Jasper		20,748		16,045	
Variscite	Carnarvon	100		60,054	
TOTAL GEM & SEMI-PRECIOUS STONE				95,200	

TABLE 3 (cont.)

QUANTITY & VALUE OF MINERALS & PETROLEUM BY LOCAL GOVERNMENT AREA

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE AS (p.55)	Ref.
GOLD			Au kg		
	Boddington		7,173	103,560,913	
	Coolgardie		19,857	287,164,272	
	Cue		4,669	66,549,798	
	Dundas		3,256	46,682,967	
	East Pilbara		9,699	138,804,713	
	Kalgoorlie-Boulder		54,343	782,360,083	
	Laverton		15,141	218,318,731	
	Leonora		38,337	552,632,108	
	Meekatharra		13,611	195,741,382	
	Mt Magnet		7,753	112,666,862	
	Sandstone		717	10,692,265	
	Wiluna		14,980	214,685,407	
	Yalgoo		314	4,388,092	
	Yilgarn		14,003	201,325,436	
TOTAL GOLD			203,853	2,935,573,029	(g)
GYPSUM					
	Carnarvon	1,075,670		20,256,138	
	Dalwallinu	69,015		1,406,737	
	Dandaragan	28,139		281,390	
	Dundas	16,440		98,642	
	Irwin	11,927		185,641	
	Koorda	220		2,640	
	Lake Grace	27,713		232,042	
	Norseman	8,485		67,880	
	Nungarin	13,482		80,892	
	Ravensthorpe	5,250		31,500	
	Wyalkatchem	48,227		385,814	
	Yilgarn	2,444		20,260	
TOTAL GYPSUM		1,307,013		23,049,576	(f)
HEAVY MINERAL SANDS					
Garnet Sand	Northampton	103,815		12,471,320	
Ilmenite	Augusta-Margaret River	83,290	TiO ₂ %	10,037,597	
	Bunbury City	471,723	55.00	68,232,208	
	Capel	401,946	56.12	51,884,537	
	Carnamah	206,388	56.04	21,729,898	
	Northampton	5,103	60.00	643,028	
Total Ilmenite		1,168,450		152,527,268	
Upgraded Ilmenite	Capel	105,744	TiO ₂ %	56,188,074	
	Carnamah	250,299	92.00	141,199,236	
	Dandaragan	198,099	92.00	129,327,397	
Total Upgraded Ilmenite		554,142		326,714,707	
Leucoxene	Bunbury City	7,695	TiO ₂ tonnes	4,119,781	
	Capel	14,849	6,401	7,854,249	
	Dandaragan	16,520	6,300	4,403,360	
Total Leucoxene		39,064	31,291	16,377,390	

TABLE 3 (cont.) QUANTITY & VALUE OF MINERALS & PETROLEUM BY LOCAL GOVERNMENT AREA

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE A\$ (p.55)	Ref. (p.55)
Rutile	Bunbury City	7,941	TiO ₂ tonnes 4,842	4,004,752	
	Carnamah	68,715	19,765	53,878,565	
	Dandaragan	21,456	19,471	14,567,815	
	Total Rutile	98,112	77,807	72,451,132	
Zircon	Augusta-Margaret River	3,007	ZrO ₂ tonnes 736	687,741	
	Bunbury City	32,842	2,738	13,170,385	
	Capel	65,132	10,738	27,888,399	
	Carnamah	167,544	27,023	76,131,886	
	Dandaragan	74,603	8,173	33,403,233	
	Total Zircon	343,128	49,408	151,281,644	
TOTAL HEAVY MINERAL SANDS				731,823,461	(a)
INDUSTRIAL PEGMATITE MINERALS					
Feldspar	Marble Bar	42,241		1,633,406	
	Mukinbudin	757		15,597	
Total Feldspar		42,998		1,649,003	(e)
IRON ORE					
Domestic Ore	East Pilbara	6,037,470	Fe % 64.52	154,209,360	
	Ashburton	78,371,415	61.46	1,868,898,309	
	Derby-West Kimberley	403,699	65.96	7,179,860	
	East Pilbara	64,886,910	61.07	1,661,388,322	
	Yilgarn	1,458,664	63.87	30,448,135	
Total Exported Ore		145,120,688		3,567,914,626	
TOTAL IRON ORE		151,158,158		3,722,123,986	(a)
LIMESAND-LIMESTONE-DOLOMITE					
Dolomite	Lake Grace	2,932		64,504	
Limesand-Limestone	Broome	19,945		99,725	
	Carnamah	22,117		88,468	
	Cockburn	1,782,920		5,259,615	
	Coorow	6,430		32,150	
	Dandaragan	11,351		51,078	
	Dundas	217,020		3,255,300	
	Gingin	29,216		459,995	
	Irwin	167,448		435,496	
	Kwinana	285,676		759,993	
	Manjimup	11,276		169,142	
	Shark Bay	2,129		282,519	
	Wanneroo	248,144		2,408,667	
	Wiluna	141,854		283,708	
	Total Limesand-Limestone		2,945,525		13,585,856
TOTAL LIMESAND-LIMESTONE-DOLOMITE		2,948,457		13,650,360	(e)
MANGANESE ORE					
	East Pilbara	212,382	Mn % 48.21	25,684,859	(a)

TABLE 3 (cont.)

QUANTITY & VALUE OF MINERALS & PETROLEUM BY LOCAL GOVERNMENT AREA

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE AS (p.55)	Ref.	
NICKEL INDUSTRY			Co tonnes			
Cobalt By-Product	Coolgardie		538	28,284,290		
	Kalgoorlie-Boulder		983	25,196,777		
	Roebourne		59	3,171,922		
Total Cobalt By-Product			1,580	56,652,989 (a),(b)		
Nickel Concentrates	Coolgardie	133,299	Ni % 12.11	202,074,458		
	Kalgoorlie-Boulder	64,303	19.43	158,397,032		
	Kondinin	63,567	12.69	86,305,767		
	Leonora	323,559	13.20	536,312,547		
	Roebourne	43,256	10.42	56,203,470		
	Wiluna	243,278	18.84	574,216,961		
Total Nickel Concentrates		871,262		1,613,510,235 (i)		
Nickel Metal	Kalgoorlie-Boulder		Ni tonnes 13,253	155,086,285	(i)	
Palladium By-Product	Coolgardie		Pd kg 848	16,073,313		
			Roebourne	13	438,236	
Total Palladium By-Product			861	16,511,549 (b)		
Platinum By-Product	Coolgardie		Pt kg 119	2,347,128	(b)	
TOTAL NICKEL INDUSTRY				1,844,108,186		
PETROLEUM						
Condensate	Ashburton		Kilolitres			
			313,200	69,064,282		
			Carnamah	207	13,219	
			Irwin	1,953	306,036	
Roebourne	6,032,288	1,514,554,912				
Total Condensate			6,347,648	1,583,938,449		
Crude Oil	Ashburton		Kilolitres			
			4,522,131	1,177,194,605		
			Derby-West Kimberley	10,323	1,371,577	
			Irwin	7,132	1,291,747	
Roebourne	7,515,233	1,999,409,395				
Total Crude Oil			12,054,819	3,179,267,324		
Liquified Natural Gas	Roebourne		Btu 10 ⁶ 393,613,100	1,971,060,425		
LPG - Butane	Roebourne		Tonnes 443,576	190,900,705		
LPG - Propane	Roebourne		Tonnes 334,573	145,937,645		
Natural Gas	Ashburton		'000 m ³			
			828,713	72,775,056		
			Carnamah	36,636	5,016,190	
			Irwin	210,068	22,098,530	
Roebourne	5,470,827	478,877,053				
Total Natural Gas			6,546,244	578,766,829		
TOTAL PETROLEUM PRODUCTS				7,649,871,377 (d)		

TABLE 3 (cont.) QUANTITY & VALUE OF MINERALS & PETROLEUM BY LOCAL GOVERNMENT AREA

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE A\$ (p.55)	Ref.
SALT					
	Carnarvon	1,426,111		36,225,761	(a)
	Esperance	7,530		381,385	(h)
	Port Hedland Town	2,759,207		40,826,374	(a)
	Roebourne	3,788,953		88,653,360	(a)
	Shark Bay	703,885		14,014,314	(a)
	Wyalkatchem	71		6,128	(h)
	Yilgarn	124,012		4,905,079	(h)
TOTAL SALT		8,809,769		185,012,401	
SILICA-SILICA SAND					
Silica	Moora	97,687		976,872	
Silica Sand	Albany	61,058		992,079	
	Cockburn	41,515		456,665	
	Swan	288,346		3,132,977	
Total Silica Sand		390,919		4,581,721	
TOTAL SILICA-SILICA SAND				5,558,593	(a)
SILVER BY-PRODUCT					
			Ag kg		
	Coolgardie		243	60,748	(a)(j)
	Derby-West Kimberley		576	151,862	(a)(b)
	East Pilbara		484	117,293	(a)(j)
	Roebourne		15,328	4,093,343	(a)(j)
	Statewide		33,124	7,821,778	
	Yalgoo		59,688	14,755,016	(a)(j)
TOTAL SILVER			109,443	27,000,040	
SPONGOLITE	Plantagenet	9,915		1,909,370	
TALC					
	Meekatharra	23,024		1,611,674	
	Three Springs	146,111		11,958,105	
TOTAL TALC		169,135		13,569,779	(f)
TIN-TANTALUM-LITHIUM					
Spodumene	Bridgetown-Greenbushes	62,116	Li ₂ O ₅ % 5.58	14,448,602	
Tantalite	Bridgetown-Greenbushes	514	Ta ₂ O ₅ kg 269,824	78,670,971	
Tin	Bridgetown-Greenbushes		Sn Tonnes 576	4,756,778	
TOTAL TIN-TANTALUM-LITHIUM				97,876,351	(a)
VANADIUM					
	Mt Magnet		V ₂ O ₅ tonnes 757	4,986,776	(f)
TOTAL OF MINERALS				10,680,954,162	
TOTAL OF PETROLEUM				7,649,871,377	
TOTAL OF GOLD				2,935,573,029	
TOTAL VALUE				21,266,398,568	

TABLE 4 ROYALTY RECEIPTS 1998-99, 1999-00

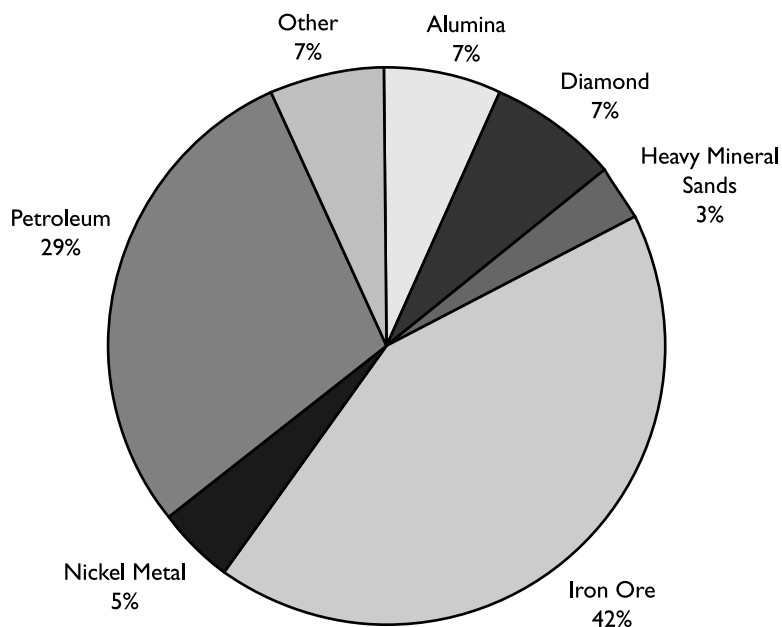
COMMODITY/Mineral	1998-99 Total A\$	1999-00 Total A\$	1999-00 A\$	Growth %
BASE METALS				
Copper	1,701,389	1,707,404	6,015	0
Lead	841,126	1,043,327	202,201	24
Zinc	7,001,603	12,558,248	5,556,645	79
TOTAL BASE METALS	9,544,118	15,308,979	5,764,861	60
BAUXITE-ALUMINA				
Alumina	39,138,672	40,738,370	1,599,698	4
CHROMITE				
Chromite Ore	339,834	210,106	-129,728	(38)
CLAYS	80,067	131,013	50,946	64
COAL	13,319,796	14,139,988	820,192	6
CONSTRUCTION MATERIALS				
Aggregate	91,126	83,345	-7,781	(9)
Gravel	86,311	56,021	-30,290	(35)
Rock	96,831	63,384	-33,447	(35)
Sand	588,632	395,683	-192,949	(33)
TOTAL CONSTRUCTION MATERIALS	862,900	598,433	-264,467	(31)
DIAMOND	54,940,672	62,496,275	7,555,603	14
DIMENSION STONE	3,366	2,478	-888	(26)
GEM AND SEMI-PRECIOUS STONE	0	4,079	4,079	100
GOLD	28,296,903	33,446,114	5,149,211	18
GYPSUM	489,113	485,960	-3,153	(1)
HEAVY MINERAL SANDS				
Garnet	664,172	640,900	-23,272	(4)
Ilmenite	8,364,656	8,872,246	507,590	6
Leucoxene	321,241	654,458	333,217	104
Rutile	3,823,478	4,110,177	286,699	7
Zircon	7,434,183	6,376,424	-1,057,759	(14)
TOTAL HEAVY MINERAL SANDS	20,607,730	20,654,205	46,475	0
INDUSTRIAL PEGMATITE MINERALS				
Feldspar	692	238,815	238,123	34,411
IRON ORE	231,977,012	198,952,265	-33,024,747	(14)

TABLE 4 (cont.) ROYALTY RECEIPTS 1998-99, 1999-00

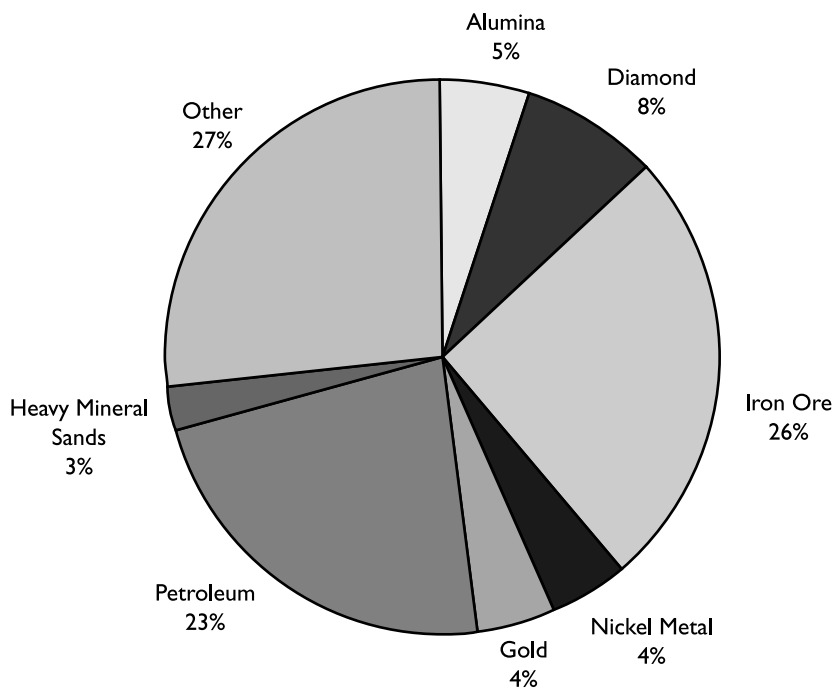
COMMODITY/Mineral	1998-99 Total A\$	1999-00 Total A\$	1999-00 A\$	Growth %
LIMESAND-LIMESTONE-DOLOMITE				
Dolomite	1,393	0	-1,393	(100)
Limesand-Limestone	1,090,599	1,209,199	118,600	11
TOTAL LIMESAND-LIMESTONE-DOLOMITE	1,091,992	1,209,199	117,207	11
MANGANESE	1,321,605	1,298,666	-22,939	(2)
NICKEL				
Cobalt by-product	1,215,161	1,052,510	-162,651	(13)
Nickel	19,976,816	34,814,528	14,837,712	74
Palladium by-product	203,473	372,097	168,624	83
Platinum by-product	68,958	73,594	4,636	7
TOTAL NICKEL INDUSTRY	21,464,408	36,312,729	14,848,321	69
PETROLEUM				
Condensate	39,253,515	97,986,735	58,733,220	150
Liquified Natural Gas	73,278,518	108,932,431	15,003,229	20
LPG - Butane	4,338,333	8,970,689	4,632,356	107
LPG - Propane	3,079,318	11,830,497	8,751,179	284
Natural Gas	23,899,820	28,894,859	4,995,039	21
Oil	33,100,373	88,281,747	55,181,374	167
TOTAL PETROLEUM	176,949,877	344,896,958	167,947,081	95
PIGMENTS				
Red Oxide	18,060	0	-18,060	(100)
SALT	1,974,670	2,268,362	293,692	15
SILICA SAND	329,134	222,095	-107,039	(33)
SILVER	370,052	398,238	28,186	8
SPONGOLITE	34,036	27,324	-6,712	(20)
TALC	64,797	97,767	32,970	51
TIN-TANTALUM-LITHIUM				
Spodumene	535,574	652,807	117,233	22
Tantalite	1,592,433	1,767,959	175,526	11
Tin	124,539	103,688	-20,851	(17)
TOTAL TIN-TANTALUM-LITHIUM	2,252,547	2,524,454	271,907	12
VANADIUM	0	19,415	19,415	100
TOTAL REVENUE	605,472,053	776,682,287	171,210,234	28

Note: All Royalty Receipts above are only those paid into the Consolidated Revenue Fund.

5 YEAR ROYALTY COMPARISON
1994-95 Total : A\$390.48 million



1999-00 Total : A\$776.68 million



Source: DME

Figure 0.2

TABLE 5 AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS & PETROLEUM INDUSTRIES

MINERAL/Company	Operating Site	1998-99	1999-00
BASE METALS			
Normandy Mining Ltd	Scuddles	384	377
Straits Resources Ltd	Nifty	253	345
Western Metals Ltd	Pillara	539	553
TOTAL BASE METALS		1,176	1,275
BAUXITE - ALUMINA			
Alcoa of Australia Ltd	Huntly	432	498
	Jarrahdale	147	71
	Kwinana Alumina Refinery	1,402	1,423
	Pinjarra Refinery	1,526	1,389
	Wagerup Alumina Refinery	1,188	864
	Willowdale	241	240
Australian Fused Materials Pty Ltd	Rockingham Fused Alumina Plant	73	107
Worsley Alumina Pty Ltd	Worsley Tunnel Road	187	176
	Worsley Refinery	1,765	2,635
TOTAL BAUXITE - ALUMINA		6,961	7,403
COAL			
Griffin Coal Mining Co. Pty Ltd	Muja	345	335
Wesfarmers Coal Ltd	Central Services	43	0
	Premier/WCL	284	379
	Western No. 5	231	0
TOTAL COAL		903	714
DIAMOND			
Argyle Diamond Mines Pty Ltd	Lake Argyle	854	854 (e)
GOLD			
Anglogold Ltd	Sunrise Dam	196	198
Amalg Resources NL	Burmill Plant	6	0
Australian Resources Pty Ltd	Gidgee	99	58
	Mt McLure	169	0
Arrow Resources	Bannockburn	48	4
Australian Gold Resources Ltd	Perth Mint	63	79
Barmingo Pty Ltd	Jenny Wren	25	13
	Newhaven	0	2
Border Gold NL	Karonie	15	0
Centaur Mining & Exploration Ltd	Mt Pleasant	496	287
	Ora Banda	1	0
Central Norseman Gold	Norseman	262	239
Consolidated Gold NL	Bardoc - Davyhurst	74	0
	Miranda	59	0

TABLE 5 (cont.) AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS & PETROLEUM INDUSTRIES

MINERAL/Company	Operating Site	1998-99	1999-00
GOLD Continued			
Croesus Mining NL	Binduli	63	46
	Hannan South	17	16
Delta Gold NL	Golden Feather Group	154	64
	Lady Ida Group	0	37
	Kanowna Belle	372	375
Equigold NL	Dalgaranga	131	132
Goldfields Kalgoorlie Ltd	Kundana	255	709
	Paddington	248	205
Great Central Mines NL	Bronzewing-Mt McClure	457	232
	Jundee-Nimary	568	505
	Wiluna	454	268
Hedges Gold Pty Ltd	Hedges	82	1
Herald Resources Ltd	Sandstone	29	4
	Three Mile Hill	60	0
	Hill 50	341	418
Hill 50 Gold NL	Darlot	453	200
	Lawlers	217	205
	Mt Morgans	56	0
	Plutonic	430	354
	Golden Mile - Super Pit	1,228	1,043
Homestake Mining Company	Lynas Find	18	0
	Mt Olympus	56	44
	Mount Group	7	0
Mount Mine Joint Venture	Dawns Hope	236	30
	Big Bell	426	323
	Jubilee/New Hampton	0	203
Newcrest Mining Ltd	New Celebration	204	264
	Telfer	585	573
	Kaltails	92	24
Normandy Kaltails Pty Ltd	Peak Hill	41	18
	Carosue Dam	0	21
North Gold (WA) Ltd	Tarmoola	277	298
	Fortnum	108	84
	Granny Smith	355	418
PacMin	Chalice	98	56
	Higginsville Group	0	12
	Barnicoat	16	34
Perilya Mines NL	Copperhead	58	15
	Cornishman	64	12
	Golden Pig and Frasers	69	10
Placer Dome Inc	Great Victoria Underground	0	13
	Marvel Loch	252	367
	Ruapehu	18	0
Resolute Ltd	Sons of Gwalia	231	190
	Yilgarn Star	181	171
	Bluebird	115	108
Sons of Gwalia NL	Mt Kemptz	0	41
	Bounty	229	228
St Barbara Mines Ltd	Tuckabianna	0	7
Troy Resources Ltd			
Viceroy Resource Corporation			
Westgold Resources NL			

TABLE 5 (cont.) AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS & PETROLEUM INDUSTRIES

MINERAL/Company	Operating Site	1998-99	1999-00
GOLD Continued			
WMC Resources Ltd	Emu	581	600
	Kambalda-St Ives	902	882
Worsley Alumina Pty Ltd	Boddington-Hedges	659	536
Other	Various	29	34
TOTAL GOLD		12,784	11,310
HEAVY MINERAL SANDS			
BHP Titanium Minerals Pty Ltd	Beenup	150	37
Cable Sands Pty Ltd	Bunbury	327	327
GMA Garnet Pty Ltd	Narngulu Garnet Plant	23	24
	Port Gregory-Hutt Lagoon	19	15
Hanwah Advanced Ceramics Australia Pty Ltd	Rockingham Zirconia Plant	19	25
Iluka Resources Limited	Capel	879	695
	Eneabba	393	310
	Narngulu Synthetic Rutile Plants	178	190
	Narngulu Dry Plant	62	62
TiWest Pty Ltd	Chandala-Muchea	228	195
	Cooljarloo	228	311
TOTAL HEAVY MINERAL SANDS		2,506	2,191
IRON ORE			
BHP Iron Ore (Goldsworthy) Ltd	Finucane Island	300	198
	Yarrie	134	243
BHP Iron Ore (Jimblebar) Ltd	Jimblebar	132	111
BHP Iron Ore Ltd	Port Hedland HBI Plant	753	763
	Mt Newman Railway	499	405
	Mt Whaleback	1,362	981
	Nelson Point	942	643
	Orebody 25	130	83
	Yandi	453	228
Hamersley Iron Pty Ltd	Brockman No. 2 Detritals Group	195	202
	Dampier Port Operations	915	837
	Hlsmelt/Kwinana	143	72
	Marandoo	193	167
	Paraburdoo/Channar	573	698
	Hamersley Railway	324	372
	Tom Price	847	856
Koolyanobbing Iron Pty Ltd	Cockatoo Island	23	34
	Koolyanobbing	26	30
Robe River Mining Co. Pty Ltd	Cape Lambert	470	426
	Pannawonica Deepdale	317	279
	Robe River Railway	101	97
TOTAL IRON ORE		9,204	7,935

TABLE 5 (cont.) AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS & PETROLEUM INDUSTRIES

MINERAL/Company	Operating Site	1998-99	1999-00
NICKEL			
Anaconda Nickel Ltd	Murrin Murrin	1,815	829
MacMahon Holdings	Blair	0	30
Centaur Mining & Exploration	Cawse	348	311
Outokumpu Mining Australia Pty Ltd	Black Swan	280	226
	Forrestania	164	29
Resolute Ltd	Bulong	267	288
Sir Samuel Mines NL	Cosmos	0	80
Tectonic Resources NL	Rav 8	0	27
Titan Resources NL	Radio Hill	64	80
Western Mining Corporation Ltd	Kalgoorlie Nickel Smelter	584	730
	Kambalda/Blair	669	353
	Kwinana Refinery	393	366
	Leinster	798	794
	Mt Keith	903	696
	TOTAL NICKEL		6,285

PETROLEUM PRODUCTS

Apache Energy Ltd	Campbell, Agincourt, East Spar, Harriet, Rosette, Sinbad, Tanami, Stag, Chervil, North Herald, South Pepper, Airlie Island	156	154
ARC	Dongara	7	7
BHP Petroleum (Australia) Pty Ltd	Griffin, Buffalo	78	68
	Tubridgi	28	26
Boral	Beharra Springs, Tubridgi	11	10
Kimberley Oil	Blina, Boundary, Lloyd, Sundown, West Terrace	4	4
	Mobil Exploration & Producing Australia Pty Ltd	Wandoo	32
Phoenix	Woodada	5	5
Premier Oil Australia Pty Ltd	Mt Horner	7	7
Chevron Australia Pty Ltd	Barrow Island, Cowle, Crest, Roller-Skate, Saladin, Yammaderry	165	165
	Woodside Energy Ltd	Cossack, Goodwyn, Hermes, North Rankin, Wanaea, Lambert	759 (r)
TOTAL PETROLEUM PRODUCTS		1,252	1,219

SALT

Cargill Salt Company	Port Hedland	112	109
	Dampier	238	225
Dampier Salt Ltd	Lake MacLeod	158	203
	Onslow Solar Salt Pty Ltd	Onslow	89
Shark Bay Salt JV	Useless Loop	78	75
TOTAL SALT		675	739

TABLE 5 (cont.) AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS & PETROLEUM INDUSTRIES

MINERAL/Company	Operating Site	1998-99	1999-00
TOTAL CLAYS		59	44
TOTAL CONSTRUCTION MATERIALS		346	368
TOTAL DIMENSION STONE		68	69
TOTAL INDUSTRIAL PEGMATITE MINERALS		31	24
TOTAL LIMESTONE - LIMESAND		171	147
TOTAL MANGANESE ORE		18	68
TOTAL PHOSPHATE		184	182
TOTAL SILICA - SILICA SAND		227	201
TOTAL TALC		54	114
TOTAL TIN - TANTALUM - LITHIUM		296	298
TOTAL VANADIUM		0	222
ALL OTHER MATERIALS		376	119
TOTAL		44,430 (r)	40,335

Source: AXTAT Reporting System, Mining Operations Division
(r) Revised

TABLE 6

PRINCIPAL MINERALS AND PETROLEUM PRODUCERS 1999-00

BASE METALS

Copper

Murchison Zinc Co. Pty Ltd, 8 Kings Park Road, West Perth WA 6005, (08) 9480 3232, Golden Grove, <http://www.normandy.com.au>

Newcrest Mining Ltd, Level 2, 30 Terrace Road, East Perth WA 6004, (08) 9270 7070, Telfer, <http://www.newcrest.com.au>

Straits Resources Ltd, 33 Colin Street, West Perth WA 6005, (08) 9322 9200, Nifty, <http://www.straits.com.au>

WMC Ltd, 250 St George's Terrace, Perth WA 6000, (08) 9442 2000, Kambalda, <http://www.wmc.com.au>

Lead - Zinc

Murchison Zinc Co. Pty Ltd, 8 Kings Park Road, West Perth WA 6005, (08) 9480 3232, Golden Grove, <http://www.normandy.com.au>

Western Metals Ltd, 263 Adelaide Terrace, Perth WA 6000, (08) 9221 2555, Lennard Shelf, <http://www.westernmetals.com.au>

BAUXITE - ALUMINA

Alumina

Alcoa of Australia (WA) Ltd, cnr Davey and Marmion Streets, Booragoon WA 6154, (08) 9316 5111, Del Park, Jarrahdale, Willowdale, Huntly, <http://www.alcoa.com/business/units/australia.asp>

Worsley Alumina Pty Ltd, PO Box 344, Boddington WA 6225, (08) 9734 8311, Boddington, <http://www.wapl.com.au>

CHROMITE

Chromite Ore

Danelagh Resources Pty Ltd, 32 Kings Park Road, West Perth WA 6005, (08) 9486 7640, Coobina.

CLAY

Attapulgit

Hudson Resources Ltd, James St Narngulu, Geraldton WA 6530, (08) 9923 3604, Lake Nerramyne.

Clay Shale

Griffin Coal Mining Co. Ltd, 28 The Esplanade, Perth WA 6000, (08) 9261 2800, Collie.

Fire Clay

Midland Brick Co. Pty Ltd, Bassett Road, Middle Swan WA 6056, (08) 9273 5522, Bullsbrook.

Kaolin

Gwalia Consolidated Ltd, 16 Parliament Place, West Perth WA 6005, (08) 9263 5555, Greenbushes, <http://www.sog.com.au>

Saponite

Watheroo Minerals Pty Ltd, PO Box 26, Watheroo, WA 6513, (08) 9651 7008, Watheroo Clays

COAL

Griffin Coal Mining Co. Ltd, 28 The Esplanade, Perth WA 6000, (08) 9261 2800, Collie.

Wesfarmers Coal Ltd, 276 Leach Highway, Myaree WA 6153, (08) 9333 0391, Collie.

CONSTRUCTION MATERIALS

Aggregate

The Readymix Group (WA), 75 Canning Highway, Victoria Park WA 6100, (08) 9212 2000, Boodarrie, Burrup-Dampier.

Gravel

WA Limestone Co, 41 Spearwood Avenue, Bibra Lake WA 6163, (08) 9434 2299, Pickering Brook.

Sand

Boral Resources (WA) Ltd, 63 Abernethy Road, Belmont WA 6104, (08) 9333 3400, Grosmont, Gnarlbine, <http://www.boral.com.au>

Rocla Quarry Products, 1 Newburn Road, Kewdale WA 6105, (08) 9353 3030, Gnangarra.

Scorpion Mining Pty Ltd, PO Box 10047, Kalgoorlie, WA 6433, (08) 9091 3586, Cawse, Coolgardie.

The Readymix Group (WA), 75 Canning Highway, Victoria Park WA 6100, (08) 9212 2000, Sandy Hill, Turner River, Widgiemooltha.

TABLE 6 (cont.)

PRINCIPAL MINERALS AND PETROLEUM PRODUCERS 1999-00

DIAMOND

Argyle Diamond Mines, 2 Kings Park Road, West Perth WA 6005, (08) 9482 1166, Argyle,
<http://www.ashton.net.au/argyle/index.html>

DIMENSION STONE**Granite**

Fraser Range Holdings Ltd, Level 1, 220 St George's Terrace, Perth WA 6000, (08) 9322 9044, Drydens Find Granite, Mungari Granite.

GOLD

Acacia Resources Ltd, 60 City Road, South Melbourne VIC 3006, (03) 9684 4999, Sunrise Dam,
<http://www.acacia.com.au>

Australian Resources Ltd, 100 Williams Street, East Sydney NSW 2001, (02) 9326 9277, Mt McClure.

Centaur Mining & Exploration Ltd, 210 Kings Way, South Melbourne VIC 3205, (03) 9234 1122,
 Mt Pleasant-Golden Kilometre, <http://www.cme.com.au>

Central Norseman Gold Corp. NL, Level 37, 250 St George's Terrace, Perth WA 6000, (08) 9442 2000,
 Central Norseman, <http://www.wmc.com.au>

Croesus Mining NL, 39 Porter Street, Kalgoorlie WA 6430, (08) 9091 2222, Binduli,
<http://www.croesus.com.au>

Delta Gold NL, 99 Walker Street, North Sydney NSW 2060, (02) 9903 4000, Golden Feather,
<http://www.deltagold.com.au>

Equigold NL, 7 Sleaford Street, Applecross WA 6153, (08) 9316 3661, Dalgara.

Goldfields Kalgoorlie Ltd, Level 16, 1 Castlereagh Street, Sydney NSW 2000, (02) 9223 2400, Kundana,
 Paddington.

Great Central Mines NL, 210 Kings Way, South Melbourne VIC 3205, (03) 9234 1111, Bronzewing, Jundee-
 Ninary, Wiluna, <http://www.gcm.com.au>

Hill 50 Gold NL, 10 Ord Street, West Perth WA 6005, (08) 9485 0070. Hill 50-Mt Magnet,
<http://www.hill50.com.au>

Homestake Mining Company, 2 Mill Street, Perth WA 6000, (08) 9212 5777, Darlot, Lawlers, Plutonic,
<http://www.homestake.com>

Kalgoorlie Consolidated Gold Mines Pty Ltd, Private Bag 27, Kalgoorlie WA 6433, (08) 9022 1100, Golden
 Mile, <http://www.kalgold.com.au>

LionOre Australia Pty Ltd, Level 2, 10 Ord Street, West Perth WA 6005, (08) 9481 5656, Bounty.

Lynas Gold NL, 50 Colin Street, West Perth WA 6005, (08) 9481 3400, Paraburdoo,
<http://www.lynasgold.com.au>

Newcrest Mining Ltd, Level 2, 30 Terrace Road, East Perth WA 6004, (08) 9270 7070, New Celebration,
 Telfer, <http://www.newcrest.com.au>

New Hampton Goldfields Ltd, 9 Havelock Street, West Perth WA 6005, (08) 9321 0611, Jubilee,
<http://www.newhampton.com.au>

Normandy Mining Ltd, 100 Hutt Street, Adelaide SA 5000, (08) 8303 1700, Big Bell,
<http://www.normandy.com.au>

North Ltd, 476 St Kilda Road, Melbourne VIC 3004, (03) 9207 5111, Kanowna Belle,
<http://www.north.com.au>

Pacific Mining Corporation Ltd, 35 Ventnor Avenue, West Perth WA 6005, (08) 9321 0616, Tarmoola.

Perilya Mines NL, 31 Ventnor Avenue, West Perth WA 6005, (08) 9423 1700, Fortnum,
<http://www.perilya.com.au>

Placer Dome Inc, 1 Alfred Street, Sydney Cove NSW 2000, (02) 9256 3800, Granny Smith,
<http://www.placerdome.com.au>

Sons of Gwalia NL, 16 Parliament Place, West Perth WA 6005, (08) 9263 5555, Bullfinch, Marvel Loch-
 Southern Cross, Sons of Gwalia, Yilgarn Star, <http://www.sog.com.au>

St Barbara Mines Ltd, 2 The Esplanade, Perth WA 6000, (08) 9323 3333, Bluebird.

WMC Ltd, 250 St George's Terrace, Perth WA 6000, (08) 9442 2000, Agnew, Kambalda-St Ives,
<http://www.wmc.com.au>

Worsley Alumina Pty Ltd, PO Box 48, Boddington WA 6390, (08) 9883 8260, Boddington.

TABLE 6 (cont.)

PRINCIPAL MINERALS AND PETROLEUM PRODUCERS 1999-00

GYPSUM

Dampier Salt (Operations) Pty Ltd, 152 St George's Terrace, Perth WA 6000, (08) 9327 2257, Lake MacLeod, <http://www.dampiersalt.com.au>

Swan Cement Ltd, PO Box 528, Kwinana WA 6966, (08) 9499 2222, Lake Hillman.

Westdeen Holdings Pty Ltd, 7 Armstrong Road, Applecross WA 6153, (08) 9364 4951, Lake Cowcowing.

HEAVY MINERAL SANDS

Garnet Sand

GMA Garnet Pty Ltd, PO Box 188, Geraldton WA 6530, (08) 9923 3644, Port Gregory, <http://www.gmagarnet.com>

Ilmenite, Leucoxene, Rutile and Zircon

BHP Titanium Minerals Pty Ltd, PO Box 22, Karridale WA 6288, (08) 9758 2500, Beenup, <http://www.bhp.com.au>

Cable Sands (WA) Pty Ltd, PO Box 133, Bunbury WA 6230, (08) 9721 0200, Busselton, Jangardup, Waroona, Sandalwood.

Iluka Resources Ltd, Private Mail Bag 5010, Geraldton WA 6531, (08) 9956 8444, Capel, Eneabba, Yoganup.

TiWest Pty Ltd, 1 Brodie-Hall Drive, Bentley WA 6102, (08) 9365 1333, Cooljarloo.

IRON ORE

BHP Iron Ore (Goldsworthy) Ltd, 200 St George's Terrace, Perth WA 6000, (08) 9320 4444, Nimingarra-Yarrie, <http://www.bhp.com.au>

BHP Iron Ore Ltd, 200 St George's Terrace, Perth WA 6000, (08) 9320 4444, Newman, Yandicoogina, <http://www.bhp.com.au>

Channar Mining Pty Ltd, 152 St George's Terrace, Perth WA 6000, (08) 9327 2327, Channar.

Hamersley Iron Pty Ltd, 152 St George's Terrace, Perth WA 6000, (08) 9327 2327, Brockman, Marandoo, Paraburdoo, Tom Price, Yandicoogina.

Koolyanobbing Iron Pty Ltd, 1 William Street, Perth WA 6000, (08) 9426 3388, Cockatoo Island, Koolyanobbing.

Robe River Iron Associates, 12 St George's Terrace, Perth WA 6000, (08) 9421 4747, Pannawonica.

LIMESAND - LIMESTONE

Cockburn Cement Ltd, Russell Road, East Munster WA 6166, (08) 9411 1000, Cockburn, Dongara, Wanneroo.

Limestone Resources Australia Pty Ltd, Parkland Road, Cnr Hasler Street, Osborne Park WA, 6017, (08) 9443 4244, Wanneroo, Moore River, Carabooda.

Loongana Lime Pty Ltd, PO Box 808, Kalgoorlie WA 6433, (08) 9021 8055, Loongana.

WA Limestone Co., 41 Spearwood Avenue, Bibra Lake WA 6163, (08) 9434 2299, Postans.

Westdeen Holdings Pty Ltd, 7 Armstrong Road, Applecross WA 6153, (08) 9364 4951, Dongara-Denison, Cervantes, Lancelin, Yanchep.

Westlime (WA) Ltd, PO Box 442, Dongara WA 6525, (08) 9927 2475, Dongara.

MANGANESE

Pilbara Manganese Pty Ltd, 62 Colin Street, West Perth WA 6005, (08) 9321 3633, Woodie Woodie, <http://www.consminerals.com.au>

NICKEL

Anaconda Nickel Ltd, Level 12, 2 Mill Street, Perth WA 6000, (08) 9212 8400, Murrin Murrin, <http://www.anaconda.com.au>

Australian Nickel Mines, 1st Floor, 24 Outram Street, West Perth WA 6005, (08) 9481 6040, Radio Hill.

Black Swan Nickel Pty Ltd, Locked Bag 50, Kalgoorlie Business Centre, Kalgoorlie WA 6433, (08) 9024 0240, Silver Swan.

Centaur Mining and Exploration Ltd, 23 Ventnor Avenue West Perth WA 6005, (08) 9481 7777, Cawse, <http://www.cme.com.au>,

Outokumpu Australia Pty Ltd, 141 Burswood Road, Burswood WA 6100, (08) 9334 7333, Silver Swan, <http://www.outokumpu.com>

Preston Resources Ltd, Level 1, 16 Ord Street, West Perth WA 6005, (08) 9322 4166, Bulong, <http://www.prestonres.com.au>

WMC Ltd, 250 St George's Terrace, Perth WA 6000, (08) 9442 2000, Blair, Kambalda, Leinster, Mt Keith, <http://www.wmc.com.au>

TABLE 6 (cont.)

PRINCIPAL MINERALS AND PETROLEUM PRODUCERS 1999-00

PALLADIUM

WMC Ltd, 250 St George's Terrace, Perth WA 6000, (08) 9442 2000, Kambalda, <http://www.wmc.com.au>

PETROLEUM

Apache Energy Ltd, Level 3, 256 St George's Terrace, Perth WA 6000, (08) 9422 7222, East Spar, Harriet, Stag, Airlie Island, Campbell, Agincourt, Rosette, Sinbad, Tanami, Chervil, North Herald, South Pepper.

ARC Energy NL, 35 Ventnor Avenue, West Perth WA 6005, (08) 9486 7333, Dongara, <http://www.arcenergy.com.au>

BHP Petroleum Pty Ltd, Central Park, 152-158 St George's Terrace, Perth WA 6000, (08) 9278 4888, Buffalo, Griffin, <http://www.bhp.com.au>

Boral Energy Resources Ltd, 339 Coronation Drive, Milton QLD 4064, (07) 3858 0600, Beharra Springs, Tubridgi, <http://www.boral.com.au>

Chevron Australia Pty Ltd, Level 24, QV1 Building, 250 St George's Terrace, Perth WA 6000, (08) 9216 4000, Barrow Island, Crest, Roller-Skate, Saladin, Cowle, Yammaderry.

Kimberley Oil NL, Suite 12B, 573 Canning Highway, Alfred Cove WA 6154, (08) 9330 8876, Blina, Boundary, Lloyd, West Terrace.

Mobil Exploration & Producing Australia Pty Ltd, Level 29, QV1 Building, 250 St George's Terrace, Perth WA 6000, (08) 9424 9200, Wandoo.

Phoenix Energy Pty Ltd, 10th Floor, The Griffin Centre, 28 The Esplanade, Perth WA 6000, (08) 9261 2800, Woodada.

Premier Oil Australia Pty Ltd, Level 3, 31 Ventnor Avenue, West Perth 6005, (08) 9480 4100, Mt Horner.

Woodside Energy Ltd, 1 Adelaide Terrace, Perth WA 6000, (08) 9348 4000, Cossack, Goodwyn, Hermes, Lambert, North Rankin, Wanaea, <http://www.woodside.com.au>

PLATINUM

WMC Ltd, 250 St George's Terrace, Perth WA 6000, (08) 9442 2000, Kambalda, <http://www.wmc.com.au>

SALT

Cargill Salt, North West Coastal Hwy, Port Hedland WA 6721, (08) 9173 0200, Port Hedland.

Dampier Salt (Operations) Pty Ltd, 152-158 St George's Terrace, Perth WA 6000, (08) 9327 2257, Dampier, Lake MacLeod, <http://www.dampiersalt.com.au>

Shark Bay Salt Joint Venture, 22 Mount Street, Perth WA 6000, (08) 9420 4320, Useless Loop, <http://www.clough.com.au>

WA Salt Supply Ltd, Cockburn Road, Hamilton Hill WA 6163, (08) 9335 9911, Lake Deborah East, Pink Lake.

SILICA - SILICA SAND

Silica

Simcoa Operations Pty Ltd, PO Box 1389, Bunbury WA 6231, (08) 9780 6666, Dalaroo.

Silica Sand

Rocla Quarry Products, 1 Newburn Road, Kewdale WA 6105, (08) 9353 3030, Gnangarra.

The Readymix Group (WA), 75 Canning Highway, Victoria Park WA 6100, (08) 9212 2000, Jandakot.

TT Sand Pty Ltd, 55 St George's Terrace, Perth WA 6000, (08) 9221 2304, Mindijup.

SPONGOLITE

Supersorb Minerals NL, 55 Collie Street, Albany WA 6330, (08) 9842 1955, Woogenellup.

TALC

Commercial Minerals Ltd, 26 Tomlinson Road, Welshpool WA 6106, (08) 9362 1411, Mt Seabrook.

WMC Ltd, PO Box 116, Three Springs WA 6519, (08) 9954 5047, Three Springs, <http://www.wmc.com.au>

TIN - TANTALUM - LITHIUM

Spodumene

Sons of Gwalia Ltd, 16 Parliament Place, West Perth WA 6005, (08) 9263 5555, Greenbushes, Wodgina, <http://www.sog.com.au>

Tantalite - Tin

Sons of Gwalia Ltd, 16 Parliament Place, West Perth WA 6005, (08) 9263 5555, Greenbushes, Wodgina, <http://www.sog.com.au>

VANADIUM

Precious Metals Australia Ltd, Level 3, 18 Richardson Street, West Perth WA 6005, (08) 9481 3777, Windimurra, <http://www.pmal.com.au>

ABBREVIATIONS, REFERENCES, UNITS AND CONVERSION FACTORS

As the document makes use of abbreviations and references, an explanation of each has been included below. A conversion table, relating the units by which various commodities are measured, has also been provided.

ABBREVIATIONS

cons	concentrates	n/a	not applicable
f.o.t.	free on truck	f.o.b.	free on board
AS	Australian Dollar	¥	Japanese Yen
ABS	Australian Bureau of Statistics	US\$	United States Dollar
AFR	Australian Financial Review	GDP	Gross Domestic Product
CSO	Central Selling Organisation	BMR	Bureau of Mineral Resources
DRI	Direct Reduced Iron	HBI	Hot Briquetted Iron
RBA	Reserve Bank of Australia	IMF	International Monetary Fund
ABARE	Australian Bureau of Agricultural and Resource Economics		

REFERENCES TABLE 3

- (a) Estimated f.o.b. value.
- (b) Metallic by-product of nickel mining.
- (c) Value based on the average Australian value of alumina as published by the ABS.
- (d) Delivered/shipped value.
- (e) Value at works.
- (f) Estimated ex-mine value.
- (g) London PM Gold Fix price as supplied by WA Treasury Corp.
- (h) Estimated f.o.t. value.
- (i) Estimated f.o.b. value based on the current price of nickel-containing products.
- (j) By-products of gold mining.
- (r) Revised from previous edition.

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 (lbs)
	1 tonne	(t)	= 1.10231 United States short ton [1 US short ton = 2,000 lbs]
	1 tonne	(t)	= 0.98421 United Kingdom long ton [1 UK long ton = 2,240 lbs]
Volume	1 kilolitre	(kl)	= 6.28981 barrels (bbls)
	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

Coal	19.7 GJ/t
Condensate	32.0 MJ/L
Crude oil	37.0 MJ/L
LNG	25.0 MJ/L
Natural gas	38.2 MJ/m ³
LPG-butane	28.7 MJ/L (1tonne LPG-butane = 1,720 litres)
LPG-propane	25.4 MJ/L (1tonne LPG-propane = 1,960 litres)

Prefix

kilo (k)	10 ³
mega (M)	10 ⁶
giga (G)	10 ⁹
tera (T)	10 ¹²
peta (P)	10 ¹⁵

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For further information on the mineral and petroleum resources of Western Australia to complement this publication please refer to:

- Mineral and Petroleum Exploration and Development
- Atlas of Mineral Deposits and Petroleum Fields



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Corporate Policy, Planning and Services

Mineral House
Department of Minerals and Energy
100 Plain Street
East Perth WA 6004

Telephone local: (08) 9222 3102

International: 61 8 9222 3102

Facsimile local: (08) 9222 3838

International: 61 8 9222 3838

Email: j.gregory@dme.wa.gov.au