

Western Australia

Statistics Digest

Mineral and Petroleum Production

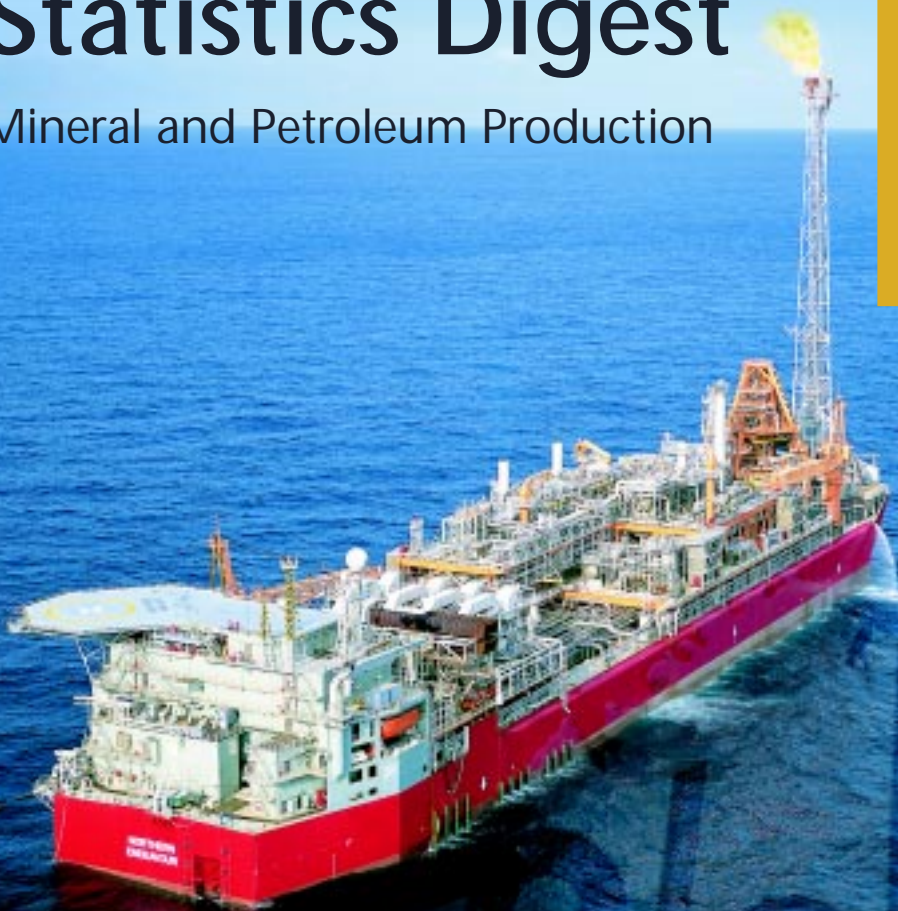


2000



DEPARTMENT OF
MINERALS AND ENERGY
WESTERN AUSTRALIA

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CONTENTS

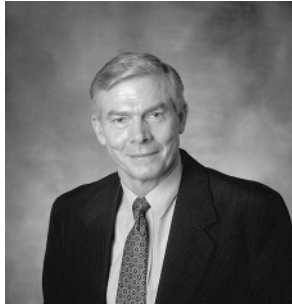
	Page
FOREWORD	1
1. ECONOMIC AND SOCIAL ENVIRONMENT	2
1.1 Economy Review	2
1.2 Economic Factors Affecting the Mining Industry	6
1.3 Social and Political Factors Affecting the Mining Industry	7
2. RESOURCE FOCUS 2000	9
2.1 Overview and Outlook	9
2.2 Petroleum	10
2.3 Iron Ore	13
2.4 Gold	16
2.5 Alumina	19
2.6 Nickel	21
2.7 Heavy Mineral Sands	24
2.8 Diamonds	26
2.9 Other Minerals	28
3. EXPLORATION, INVESTMENT AND EMPLOYMENT	30
3.1 Mineral Exploration	30
3.2 Petroleum Exploration	31
3.3 Mining Investment	31
3.4 Mining Employment	32
 TABLES	
1. Quantity and Value of Minerals and Petroleum	34
2. Quantity and Value of Selected Major Commodities	36
3. Quantity and Value of Minerals and Petroleum by Local Government Area	39
4. Royalty Receipts 1999 and 2000	45
5. Average Number of Persons Employed in the WA Minerals and Petroleum Industries	48
6. Principal Minerals and Petroleum Producers 2000	52
Abbreviations, References, Units and Conversion Factors	56

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LIST OF FIGURES

	Figures	Page
1.1	Exchange Rate US\$/A\$	4
1.2	Trade Weighted Index	6
2.1	Petroleum Exports	11
2.2	TAPIS Crude Oil Price	11
2.3	Crude Oil and Condensate - Quantity and Value by Quarter	12
2.4	Crude Oil and Condensate Quantity	13
2.5	Iron Ore Exports	14
2.6	Iron Ore Price	14
2.7	Iron Ore - Quantity and Value by Quarter	15
2.8	Iron Ore Quantity	16
2.9	Gold Exports	16
2.10	Gold Price	17
2.11	Gold - Quantity and Value by Quarter	18
2.12	Gold Production	18
2.13	Alumina Exports	19
2.14	Alumina Price	19
2.15	Alumina - Quantity and Value by Quarter	20
2.16	Alumina Quantity	20
2.17	Nickel Exports	21
2.18	Nickel Price	22
2.19	Nickel - Quantity and Value by Quarter	22
2.20	Nickel Quantity	23
2.21	Heavy Mineral Sands Exports	24
2.22	Heavy Mineral Sands Price Index	24
2.23	Heavy Mineral Sands - Value by Quarter	25
2.24	Heavy Mineral Sands - Value of Production	25
2.25	Selected WA Commodities Relative to World Production	33
0.1	5 Year Value Comparison 1995 and 2000	38
0.2	5 Year Royalty Comparison 1995 and 2000	47
0.3	Local Government Boundaries (map)	57
0.4	Major Minerals and Petroleum Projects in Western Australia	Inside Back Cover

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 2000 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 2000 the State's minerals and energy sector set a new record, with the value of sales rising by over 50% to around \$25.7 billion. This compares with a decade average annual growth rate of 8.3%.

Whilst most of the State's minerals and energy industries recorded growth in sales quantities, the overall rise in the value of sales for 2000 is mainly attributed to the significantly increased performance by the petroleum sector, supported by a general improvement in commodity prices, accompanied by a depreciating Australian dollar.

These outcomes for petroleum are unprecedented and 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 export income and around one-sixth (both directly and indirectly), of employment.

Western Australia continues to maintain its prominence on the international minerals scene, although the current difficult international trading conditions mean that future prospects for the sector point to the likelihood of only modest growth over the short term.

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 recent moves towards further deregulation of the energy sector, as well as improvements in the availability of infrastructure, augur well for the mining industry taking up downstream processing opportunities. It is also important that, where possible, the State continues in its endeavours to reduce uncertainties in the local operating environment. Native title issues, Greenhouse emissions and declining mineral exploration 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 this Digest.

1. ECONOMIC AND SOCIAL ENVIRONMENT

1.1 Economy Review

1.1.1 World Economy

The State's growth prospects continue to be reliant on world economic conditions

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

The international environment has deteriorated considerably since late 2000 following a period of strong world economic conditions from mid-1999 onwards. This earlier strengthening in economic conditions was responsible for solid export growth by Western Australia through this period.

In the 12 months to February 2001, the State's trade surplus increased by just under 60% to \$21.1 billion, the highest on record. This is in contrast to a trade deficit of \$4.9 billion for Australia as a whole over the same period. Around 70% of the State's exports are from the mineral and petroleum sector.

Conditions in the world economy remain uncertain

Conditions in the world economy, including those of Western Australia's major trading partners, remain uncertain. The recent slowing in the international economy has given rise to a significant reassessment of global growth prospects over the short term.

The US economy and financial markets have been a key component of the above assessments, with a sharp fall in growth in the December quarter 2000, followed by expectations of negative growth for the following March quarter 2001. These expectations were not realised with the data recording a modest 0.5% growth for the quarter and 2.7% growth over the year to March 2001 – less than half that recorded in the middle of 2000.

The IMF has reduced its forecast for global growth for 2001 to 3.2% as opposed to the 4.2% growth rate that was predicted in October 2000. These expected growth rates are significantly down on the growth of 4.8% recorded in 2000. This downgrading has been largely driven by increasing pessimism about the outlook for the US economy and the effect that this is likely to have on those countries, including Australia, that have extensive trade linkages with the US.

A rebound in world growth expected in 2002

A rebound in world growth is expected in 2002, but this recovery will be highly dependent on the recovery in the US economy. The IMF has predicted that the US growth rate will increase to 2.5% in 2002 from 1.5% in 2001. The expectations for positive, albeit modest growth, in 2001 result from the anticipated effects of the substantial easing in monetary policy evidenced recently, with a reduction of 2 percentage points in official interest rates by the US Federal Reserve since the start of the year.

Oil prices have declined from their highs recorded in mid-2000

This slowing in international growth has meant that world inflationary pressures have been generally well contained to date, with the major pressure being the rise in the price of oil. However this appears to have had limited flow-on effects on other prices, and more recently this pressure has eased as oil prices have declined from their highs recorded in mid-2000.

Japan's economic prospects continue to be negative

Growth in the Japanese economy slowed in the second half of 2000 and the short-term outlook appears to be fairly negative. The Ministry of Economy, Trade and Industry's overall business activity index shows that activity has remained flat over the recent period with economic growth of 0.2% over the last half of 2000 as opposed to 5.4% in the first half of the year. Over the six months to March 2001 industrial production declined by 6% whilst machinery orders also fell by 16%. These factors have prompted businesses to scale back their short-term capital expenditure intentions. IMF forecasts expect economic growth of 0.6% in 2001 moving to 1.5% in 2002.

This difficult outlook has prompted the Bank of Japan to return to its zero interest rate policy with the intention that this policy be retained until consumer prices stop falling. Prices (excluding food) fell by 0.6% over the year to March 2001. The government has also recently announced measures to facilitate the removal of non-performing loans from domestic bank balance sheets over the next two to three years as well as proposals to limit banks' corporate share holdings.

Non-Japan Asia growth slows to more sustainable levels

After experiencing strong growth in the first three quarters of 2000, economic growth in non-Japan Asia slowed significantly in the December quarter, caused by falls in both external and private domestic demand. This slowdown was most evident in Singapore and Korea, both of which recorded declines in real GDP. As a result of the slowing US economy, exports from the region declined by 2% in the December quarter 2000 following growth of around 15% over the first three quarters of the year.

In response to this weaker outlook for the external sector and falling domestic spending, macro-economic policies across the region have been eased to support growth in the short term. China is expected to continue its strong performance into 2001 with expected growth of 7% and similar figures in 2002. This follows growth of 8% in 2000.

Euro area experiences steady growth

Growth in Europe strengthened in 1999-2000 to 3.2%, on the back of an accommodative monetary policy, falling unemployment, rising domestic demand and improved export demand. This steady growth appears to have continued over the remainder of 2000 and into 2001 although moderating slightly. Inflation has also increased gradually in Europe, influenced mainly

by rising oil prices, but also by strong credit growth, and improving growth prospects. These inflationary pressures have eased more recently but at 2.6% in March 2001 remain above the 2% target rate.

IMF forecasts indicate that economic growth in the Euro area is expected to reach 2.4% in 2001, moving up to 2.8% in 2002. These figures are down on the growth of 3.4% realised during 2000.

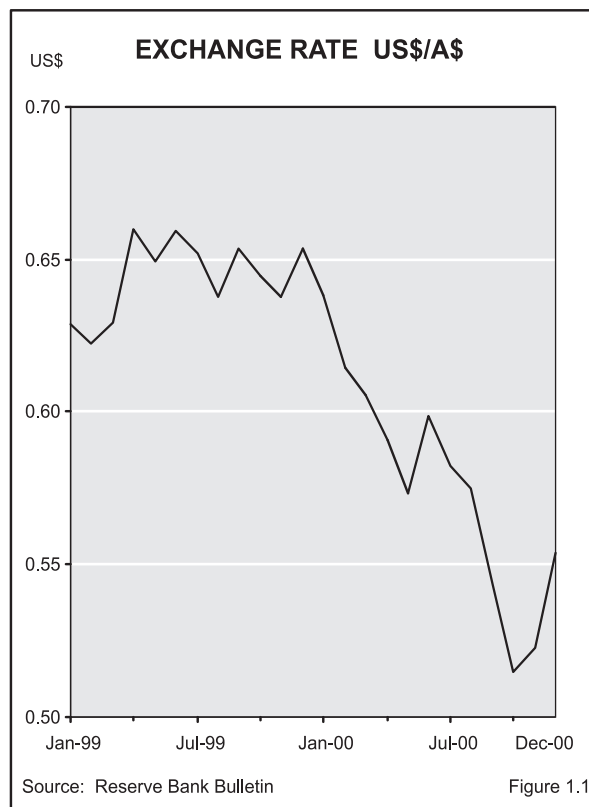
1.1.2 Australian Economy

Australian economy records moderate growth over 2000

The ABS national accounts for the December quarter 2000 showed that the Australian economy contracted marginally over the second half of the year following a significant term of strong growth, realising growth of 2.1% during the year. To a large extent this downturn is attributable to domestic influences with a sharp downwards swing in dwelling investment following the introduction of the new tax system in mid 2000, which provided an incentive to shift housing construction activity into the first half of the year. The economic growth rate for 1999-00 was 4.9% and the forecast for 2000-01 was set at around 4% although this seems likely to come in at a rate of around 2.75% to 3%.

Strong world growth and a low dollar helped to increase exports during 2000

The external sector provided a major boost to the economy during 2000, contributing one percentage point to the growth in GDP. Strong world growth and a lower exchange rate helped to increase export volumes, while the slowing in domestic demand and the increased cost of consumer



imports (as a result of exchange rate depreciations) retarded the growth in imports.

Prospects for an easing in the growth in the Australian economy as a result of the factors highlighted previously, have prompted the Reserve Bank of Australia (RBA) to reduce interest rates by 1.25 percentage points since the beginning of 2001 to 5%. This reduction has been less than that for US rates but it has been more rapid than the previous easing cycle in 1996-97, when the first three reductions in rates were spread over six months. The favourable inflation outlook has allowed the RBA to move quickly to a monetary policy stance supportive of domestic economic activity.

Underlying inflation remains within the Reserve Bank target range

The Consumer Price Index (CPI) increased by 4.5% during 2000 and by 6.0% in the year to the March quarter 2001. The recent tax changes continue to affect CPI measures of inflation along with the impacts of increases in petrol prices. Allowing for these effects the underlying inflation rate is estimated to be between 2% and 2.5%, within the RBA annual inflation target.

In 2000 the A\$ depreciated considerably and it has continued to do so in 2001, reaching an all-time-low of US 47.8 cents in early April from its local peak in early January of US 57.3 cents. This was one of the largest percentage falls in the currency in such a short period since the mid-1980s and was in direct contrast with most of the positive forecasts for the currency at the opening of 2001. The current level of the dollar (as at May 2001) at around US 52 cents is still significantly low, although while it remains weak it continues to provide good news for the economy by fostering increased exports and dampening import pressures, with the only threat being the effect of the dollar's decline on business confidence and consumer sentiment.

1.1.3 Western Australian Economy

WA domestic economy records a contraction

Over the course of 2000 the State's domestic economy (excluding net exports) contracted by 0.7% as measured by State Final Demand. This reflected a fall in dwelling investment over the latter part of the year along with reduced household consumption and public spending. However a turnaround in dwelling investment is expected on the back of the implementation of an increase in the Commonwealth First Home Owners grant from \$7,000 to \$14,000 and recent reductions in interest rates.

Business investment bounced back in the December quarter 2000 but it is still substantially down on figures recorded a year earlier. Recent surveys indicate that a strong pick-up in activity is expected over the remainder of 2000-01. The recent approval of the expansion of the North West Shelf project is also likely to make a significant contribution to future investment levels with site works already underway.

WA exports experience strong increase

In annual terms the value of Western Australia's exports increased by 40% during the year to be worth over \$29.5 billion compared with a modest 1.3% increase in imports. This solid growth in exports continued into the March quarter 2001 with a 13.3% increase during the quarter. Imports rose by 11.9% during the quarter, with the main contributors to the increase being plant, equipment and building materials, reflecting the expected increase in investment levels.

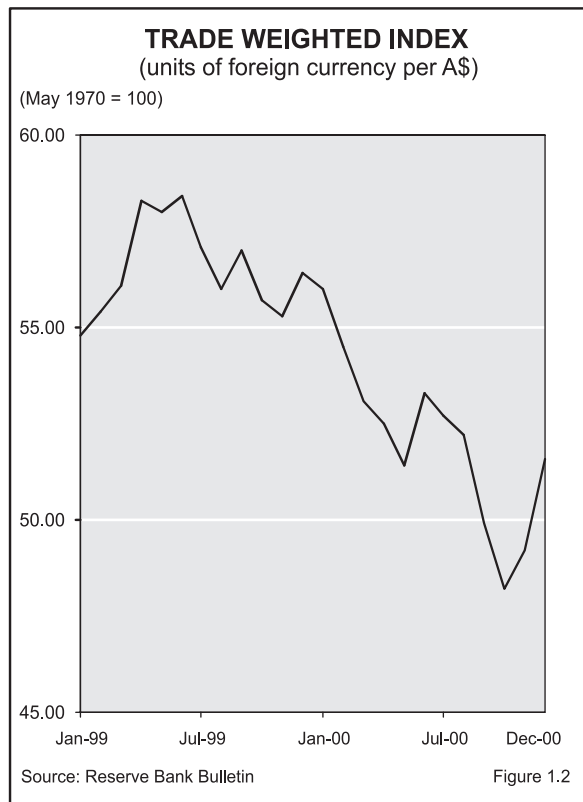
State Treasury has forecast overall economic growth in Western Australia to be around 4% in 2000-01 following achievement of similar growth levels in 1999-00. This growth is projected to increase to 5% in 2001-02.

1.2 Economic Factors Affecting the Mining Industry

World commodity prices improve over 2000

For the resources industry in general, 2000 saw a period of increased commodity prices on the back of significantly stronger global economic growth resulting from strong increases in world consumption of most minerals and energy commodities and low availability of stocks of these commodities.

In terms of price, the most notable performers in world commodity markets were oil and nickel, with crude oil prices recording a significant 60% increase over the previous year and nickel showing a 44% increase. Copper prices recorded a less notable but still significant increase of 15% during the year.



A\$ undergoes significant depreciation

The significant depreciation of the Australian dollar over the course of 2000 and into early 2001 has hit the confidence of the mining sector with respect to its ability to effectively manage currency risks. Traditionally it has been seen as good business practice to hedge, to varying degrees, a range of commodity, currency and interest rate risks. However the currency predictions of a number of forecasters have tended to be over-optimistic, exceeding the actual level by at least 10%, and leading to several companies realising significant hedging losses. This has prompted some of the larger resource companies to adopt a policy of self-insurance against commodity and currency price risks through the use of a diversified commodity portfolio as a natural hedge against such risks.

Marginal benefits to resource companies from the new tax system

With the realisation of the changes to the tax system introduced during 2000, the consensus from a number of the larger resource companies is that the benefits attributable to the new system have been marginal through the limited savings from removal of the wholesale sales tax and reduction in diesel fuel costs. The resources sector generally continues to be concerned about the loss of accelerated depreciation, which undermines the viability of future large-scale capital-intensive projects, particularly given the more favourable terms available to mining companies overseas.

When the removal of the accelerated depreciation provisions was announced in September 1999, the Commonwealth Government made the assurance that the effective life definitions for write-off periods for the petroleum industry would be reviewed and determined by 30 June 2000. At this stage these definitions are still undetermined leading to greater uncertainty for this industry and other capital-intensive projects within the resources sector.

1.3 Social and Political Factors Affecting the Mining Industry

Native title continues to have a strong impact on the mining industry

The *Commonwealth Native Title Act* (NTA) received royal assent on 24 December 1993 and came into effect on 1 January 1994. Western Australia began operating under the NTA in April 1995 and 11,000 tenements have been granted under the NTA processes since this time. The NTA requires that future acts (as defined in the NTA) must be advertised and the native title claimants given an opportunity to either (a) object in the case of the "expedited procedure" or (b) negotiate an agreement under the "right to negotiate" process of the NTA. If the native title claimants object to the expedited procedure and the objections are upheld by the National Native Title Tribunal then the title applications enter the "right to negotiate" process.

In May 2000 the Full Federal Court made a judgement (the Ward decision), on an appeal relating to the Miriuwung Gajerrong native title claim. This decision found that native title had been extinguished on enclosed and/or improved pastoral leases in WA. In July 2000 the previous government directed that where title applicants were able to demonstrate that native title had been extinguished, according to the principles set out in the Ward decision, mining tenement applications over such areas should be processed without referral

to the NTA process. It should be noted that applications have been made to appeal the Ward decision to the High Court.

EPBC Act comes into force

The Commonwealth Government's *Environmental Protection and Biodiversity Conservation Act* (EPBC Act) came into force in July 2000. This legislation provides primarily for environmental protection, conservation of biodiversity and the establishment of bilateral agreements for accreditation of existing State and Territory environmental assessment processes. Under the Act, Commonwealth involvement in the environmental assessment and approval process is triggered by projects or activities likely to have a significant impact on a matter of national environmental significance (NES) and on actions undertaken in Commonwealth areas.

These matters of NES include:

- ◆ Commonwealth marine environments;
- ◆ World Heritage properties;
- ◆ Wetlands of international importance;
- ◆ Nationally threatened species and communities;
- ◆ Migratory species;
- ◆ Nuclear actions; and
- ◆ Any other matters defined by regulation.

All other environmental matters (non-NES matters) are considered under existing State and Territory environmental assessment processes and are not assessed under the Act.

Greenhouse issues continue to be of concern

Greenhouse issues continue to be of concern to international energy producers, with discussions on global gas emissions abatement ongoing since 1990 with the development of the Kyoto Protocol in 1997. Recent discussions have focussed on the introduction of measures for Greenhouse abatement. A Kyoto Protocol meeting was held at The Hague in November 2000, and the issue is set to be discussed again in a similar forum in July 2001.

The Commonwealth is committed to the pursuit of cost-effective abatement policies and measures and the WA Government is preparing a complementary strategy. The WA Government is keen to see a balance between the reduction of global Greenhouse concentrations and the promotion of ongoing economic growth.

2. RESOURCE FOCUS 2000

2.1 Overview and Outlook

The State's minerals and energy sector achieved a new record in 2000 with the value of sales rising by 51.1% to over \$25.7 billion. This compares with the average annual growth rate from 1991 to 2000 of 8.3%.

Whilst nearly all of the State's minerals and energy industries recorded stronger sales quantities, the overall rise in the value of sales for 2000 is mainly attributable to the significant increase (106%) in the value of sales from the petroleum sector. A general improvement in commodity prices, accompanied by a depreciating Australian dollar, were the other main factors influencing the increase.

The results for the petroleum sector, with an increase in sales of over \$5 billion to just under \$10 billion, firmly entrench petroleum's position as the State's largest resource industry. Petroleum's share of the State's total resources sales value has increased from around 20% in 1991 to 39% in 2000. The next biggest sector, iron ore, which sold \$4.4 billion of output during 2000, has seen its share of production fall from 24% to 17% over the corresponding period.

Oil prices rebounded in 2000 moving from an average price of US\$19 a barrel in 1999 to US\$29 in 2000. The most spectacular rise occurred from July to November 2000 where prices rose from an average of US\$24 to US\$35 per barrel. During the year OPEC raised its official production quotas on four separate occasions. However, at its fifth meeting in November 2000, it announced that it would not increase production again despite persistent tight market conditions and record prices.

Oil was the largest sector in the Western Australian petroleum industry with sales quantities increasing by 64% to 13.98 GJ during the year. Higher oil prices, combined with these increased sales volumes drove the value of sales up significantly with a 191% increase during the year to \$4.5 billion. LNG is now the second largest sector with the value of sales increasing by 66% during the year to over \$2.4

billion, despite sales quantities decreasing marginally. The volume of condensate sales rose by 11% to 6.20 GJ, with the value of sales recording a significant 89.7% increase to \$1.92 billion. LPG (Butane and Propane) also recorded significant increases in their sales volumes of 15.5% and 30.8% respectively.

The significant increase in crude oil and LPG production was largely due to increased volumes from the Wanaea, Cossack and Hermes fields. Crude oil sales volumes were also supported by the commencement of the Buffalo and Lambert fields which offset falls in production and closures of a number of other fields.

Iron ore sales volumes increased by about 11% during the year to 158.87 Mt, with the value of sales increasing by 24% to almost \$4.4 billion. The stronger sales quantities reflect a general trend across the industry of increased shipment volumes on the back of improved world economic conditions.

This increase in the value of sales can be largely be attributed to two negotiated increases in ore prices. Talks with Japanese steel mills have led to a 4.35% increase in the price of iron ore fines and 5.77% rise in lump ore prices (effective from April 2000 to March 2001). An 11% increase in the price of ore shipped to Europe (which takes 10% of WA production) was also finalised.

In 2000 the quantity of gold sold fell by 6% to 199 tonnes. The major reason for the fall in output was the interruption to production caused by extremely wet weather in the March quarter, in addition to the closure of Newcrest's Telfer mine among a number of other projects as a result of increased operating costs and/or depleted reserves.

A 10.7% increase in the average A\$ gold price during 2000 largely offset the fall in sales volumes to help the gold industry achieve an increase of 4.76% in the value of sales for the year. Western

Australia continues to produce around three-quarters of Australia's gold output.

Sales value and volume records were again achieved by the State's alumina industry in 2000, with sales volumes increasing by 12% to 10 Mt. Increased spot prices over the earlier part of the year also enabled Australian alumina producers to negotiate an increase in their long-term contract prices to around 13.5% of the LME aluminium price, up from an average of 13% over previous years. Aluminium prices increased in the early part of the year, followed by a series of falls with an upturn in December. These price increases helped alumina to achieve a 37.9% increase in the value of sales for the year.

The \$800-million expansion of the Worsley alumina refinery completed earlier in the year increased its capacity from 1.8 million tonnes per year to 3.1 million tonnes, making the refinery one of the largest producers in the world. Billiton now has an 86% controlling stake in Worsley after acquiring the 56% interest held by US-based Alcoa Inc.

The quantity of Western Australian nickel sold increased by 25.9% to approximately 153,500 tonnes of contained nickel metal in 2000. Increased prices during the earlier part of the year on the back of increasing demand from stainless steel manufacturers in the northern hemisphere saw the value of sales more than double (107% increase) to \$2.4 billion. Western Australia currently accounts for all of Australia's nickel production. The increased sales quantities for the year were largely driven by stronger production from WMC's operations, together with the commencement of the three new nickel laterite projects (Cawse, Murrin Murrin and Bulong) which are now gearing up to full capacity. The continued development of these projects together with a number of other planned project expansions looks set to support continued future increases in these sales volumes contingent on sustained world demand.

The State's mineral sands industry experienced increases in most commodity areas over the course of 2000, with the value of sales increasing by 24.7% to over \$858 million.

The largest sector by value of the State's mineral sands industry is upgraded ilmenite (synthetic rutile). Stronger sales quantities (15.7% increase to 998.14 kt) accompanied by increased prices saw the value of sales increase by 29% over the period to \$373 million.

Sales quantities of ilmenite rose by 8% in 2000 to 1.34 Mt with a 21% increase in the value of sales to over \$185 million. Rutile experienced an increase of sales volume of 7.7% to 122.15 kt with an increased sales value of 22.3% for the year. Increased zircon sales volumes (7% increase to 347.93 kt) were supported by increased prices with the sector achieving almost 24% increase in the value of sales.

The value of diamond sales rose 11.5% during the year to set a new record figure of over \$713 million, despite an 18% fall in the volume of diamond sales to 42.30 Mct.

The value of base metal sales (copper, lead, zinc) increased by 38% to \$389.5 million in 2000. This increase was driven by stronger sales of all commodities with steady increases in the prices of copper and zinc.

The salt industry experienced a 14.5% fall in the volume of sales to 7.71 Mt and a smaller (7.3%) fall in the value of sales to just over \$197 million.

The amount of coal sold in 2000 dropped minimally by 0.43% to 6.20 Mt and lower contract prices led to the value of sales falling by 3.8% during the year to \$257.8 million.

2.2 Petroleum

Petroleum, the State's largest resource sector by value, experienced a considerable increase in the value of sales during 2000, up by a massive 106% to \$9.96 billion, on the back of hefty rises in oil prices and sales volumes throughout the year.

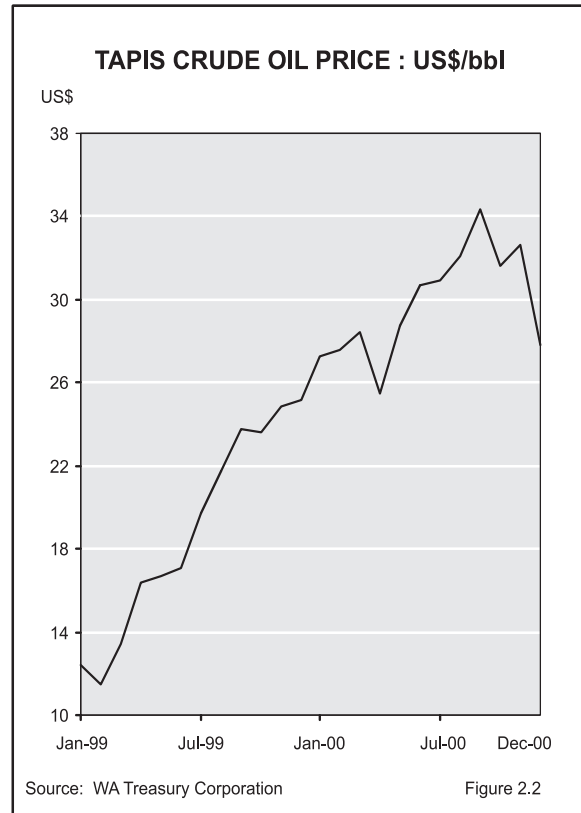
Approximately some 81% (by value) of the State's petroleum products are exported. The major destinations are Japan (46%), USA (17%), South Korea (13%), China (8%), Singapore (7%) and Taiwan (7%).

Western Australia accounts for around 48% of Australia's oil and condensate production.

Petroleum Industry Highlights for 2000

Oil prices rebounded in 2000 moving from an average of US\$24 per barrel in July to around US\$35 in late November. The annual average price of US\$19 a barrel in 1999 increased to US\$29 in 2000. During the year OPEC raised its official production quotas on four separate occasions. However at its fifth meeting in November 2000 it announced that it would not increase production again despite persistent tight market conditions and record prices. This tightening is largely a result of stronger world economic conditions.

Oil, the largest sector within the petroleum industry, recorded a 64% increase in sales quantities during the year. Higher oil prices combined with these increased sales volumes drove the value of sales up by an unprecedented 191% during the year to \$4.5 billion. 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. This had been shut down in early 1999 and sent to Dubai for a \$190-million refit that took six months. The refit, affecting the Wanaea and Cossack fields, 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. Woodside's Hermes oil field also contributed to the increase with a move to full operating capacity and Apache Energy's Stag field



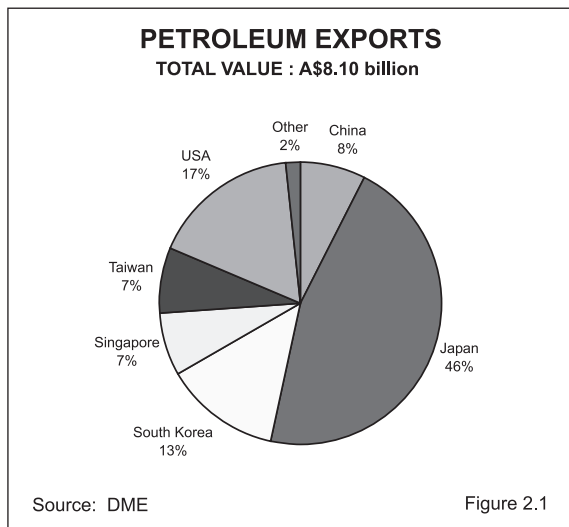
continued to ramp-up production levels during the year. Sales from the remaining oil-producing projects declined over the course of 2000.

LNG is now the second largest sector with the value of sales increasing by 66% during the year to almost \$2.5 billion, despite a marginal fall in the quantity of LNG sold to 7.3 million tonnes. Western Australia is regarded as a significant supplier on the world market accounting for 8% of world trade, with Japan being the major purchaser of LNG. 132 shipments were made during the year, with 127 going to Japan, four to the United States and one to South Korea.

The quantity of condensate sold increased by 11% in 2000 with an associated 89% increase in the value of sales on the back of strengthening oil prices during the year. The increase in sales quantities reflected an across-the-board increase in output from the State's condensate producers.

Increased sales contract volumes resulted in the quantity of natural gas sold during the year increasing by around 5% in 2000, with the value increasing by over 6% to \$608 million.

The quantity of liquefied petroleum gas (LPG -



Propane and Butane) sold in 2000 increased by 22% to over 790,000 tonnes. Its associated value increased by 108% to \$412 million, again emphasising the impact of stronger prices. Whilst the vast majority of LPG production is exported to Japan, Lebanon was another significant export destination.

World Oil Market Outlook

The uncertainty dominating world oil markets during 1999 and 2000 looks set to continue in 2001 with forecasters divided over the future for oil prices. ABARE projections (March 2001) indicate that the trade-weighted price of crude oil is expected to fall significantly in 2001 from its average of US\$27.50 a barrel in 2000 to around US\$25 a barrel in 2001. During the year OPEC indicated its determination to maintain oil prices within the range of US\$22 and US\$28 a barrel. Forecasts indicate that prices will stay within this range over 2001.

OPEC controls at least three-quarters of the world's reserves and 40% of production. The cut in daily output quotas in early 2001 of 2.5 million barrels per day (or 9% of production) has been seen as a

sign of a response to the slowing of world economic activity and an associated revision to oil demand statistics.

The International Energy Agency has revised down its predictions of demand growth by 110,000 barrels a day following an earlier reduction of 140,000 barrels a day in February. It now predicts that world oil demand will be around 76.8 million barrels per day during 2001. These forecasts indicate that oil stocks, particularly in the United States, will continue to be tight compared to normal levels and will provide enough support to prevent prices from falling significantly.

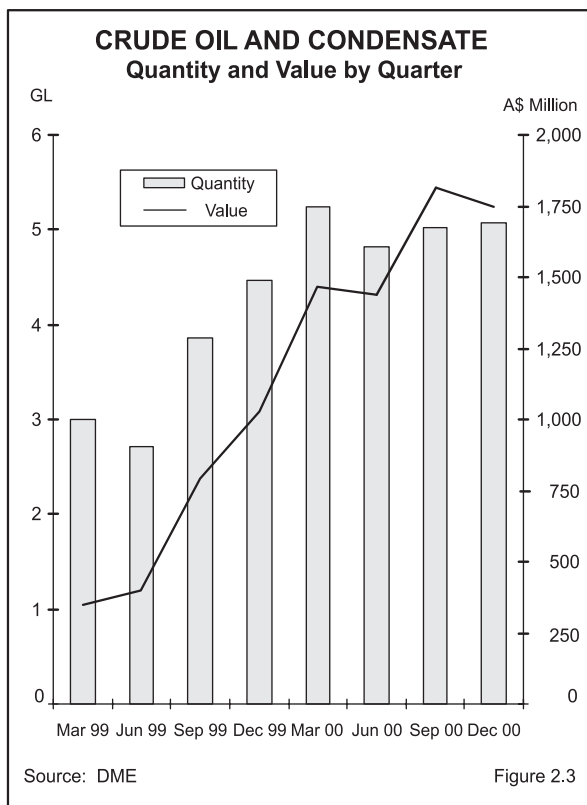
OPEC countries are expected to feature strongly in any new world oil developments, with its six largest producers (Saudi Arabia, Iraq, Kuwait, the United Arab Emirates, Iran and Venezuela) showing signs of increased investment in production capacity after the high prices experienced during 2000. Offshore West Africa, the Gulf of Mexico and the Caspian Sea are expected to be the main locations for new non-OPEC developments over the medium term.

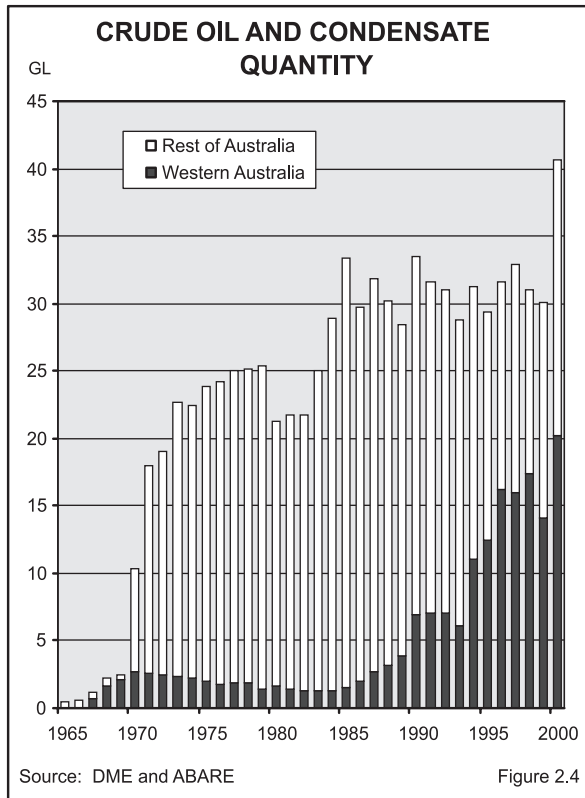
According to ABARE (March 2001) world oil production is estimated to have increased by over 3% to 76.9 million barrels per day in 2000. In 2001 it is forecast to rise further to 77.7 million barrels per day. World oil consumption is estimated to have increased by just over 1% in 2000 to 75.6 million barrels per day, with ABARE forecasting consumption to rise to 77 million barrels per day in 2001.

State Outlook

With the increased focus on investment in petroleum, WA's production is expected to continue to grow over the short to medium term with a number of prospective and planned developments.

The recent announcement by Woodside Petroleum of a \$2.4-billion expansion of the North West Shelf liquefied natural gas project, with the construction of a fourth train is set to provide significant economic benefits to the State. The project has the potential to create up to 400 jobs in Perth during the engineering and procurement process, with the construction workforce in Karratha looking to peak





at about 2000. The expansion will add to LNG production with exports forecast to increase by around \$1 billion when full production is realised in about four years.

The development of the \$8-billion Gorgon project is being progressed by partners – Texaco, Chevron, Mobil, Shell and BP – with efforts to secure long-term LNG customers in Korea, China, other parts of Asia and on the west coast of the USA. The Gorgon partners are also continuing efforts to secure long-term supply contracts with large-scale industrial gas users within WA.

During 2000 Woodside and its joint venture partners Apache and Santos, started development of the \$110-million Legendre oil field north of Dampier. Recent announcements concerning a potential doubling of previous reserve estimates for the Harriet oilfields in Western Australia’s offshore Carnarvon Basin will also provide a boost to future oil production levels. The Simpson oilfield is now being developed at a cost of about \$20 million and is expected to be in production by the end of 2001 at a rate of more than 20,000 barrels per day.

Woodside and its North West Shelf project partners have also committed \$205 million towards the development of the Echo-Yodel gas and condensate fields in the offshore Carnarvon Basin, where two undersea wells will be developed and linked by a 23-kilometre pipeline to the Goodwyn A production platform.

Apache Energy and its partners Tap Oil and Kufpec also expect production from the Gypsy oilfield to commence soon at the rate of 10,000 to 15,000 barrels per day.

Exploration drilling also achieved a record high in 2000 with some significant discoveries during the year including the Gorgon “Deeps” finds and the Jansz discovery made by ExxonMobil and its partner Texaco. Woodside is continuing its appraisal of the Vincent-Enfield-Levarda field looking to commence production in 2005. Other discoveries include those made by the North West Shelf partners at the Gaea-1 exploration well in the Carnarvon Basin, BHP Petroleum at the Griffin-8 well and Empire Oil and Gas at Rough Range.

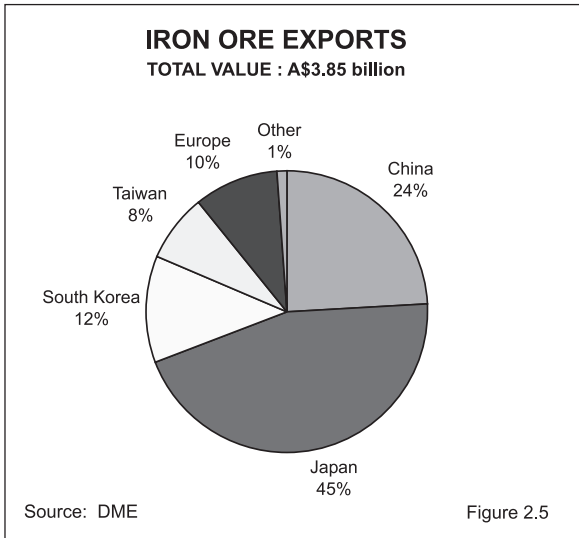
Despite the availability of significant resources, Western Australia’s natural gas production is largely dictated by domestic demand in the power generation sector. The gas sector is anticipated to grow strongly over the next 10 years due to rising demand in the industrial sector.

2.3 Iron Ore

Iron ore is the State’s second most valuable export commodity, after petroleum, worth \$4.36 billion in 2000. A significant majority (96%) of Western Australia’s iron ore was exported overseas in 2000, with 45% (by value) going to Japan, 24% to China, 12% to South Korea, 10% to Europe and 8% to Taiwan.

Western Australia is the world’s third largest producer after China and Brazil and accounts for approximately 97% of Australia’s iron ore production.

Iron ore sales grew by 11% during the year while the value of sales was up by a significant 24%



reflecting increased contract prices and the effects of the depreciating Australian dollar.

Following iron ore contract negotiations for the Japanese fiscal year (April 2000 to March 2001) Western Australia's major producers achieved a price increase of 4.35% for iron ore fines and a 5.77% increase in the price of lump ore. This price increase however should be seen in the context of a cut to contract prices in the previous year, with BHP and Hamersley receiving an 11% and 10.2% cut in the price received for lump ore and fine ore respectively. In addition they were required to accept lower export volumes with BHP taking an 8% cut and Hamersley 4%. North Limited's Robe River operations accepted a 13.4% cut, due to its poorer quality product, but maintained export volumes. These factors were the overwhelming reason behind the 15% fall in the value of iron ore sales in 1999.

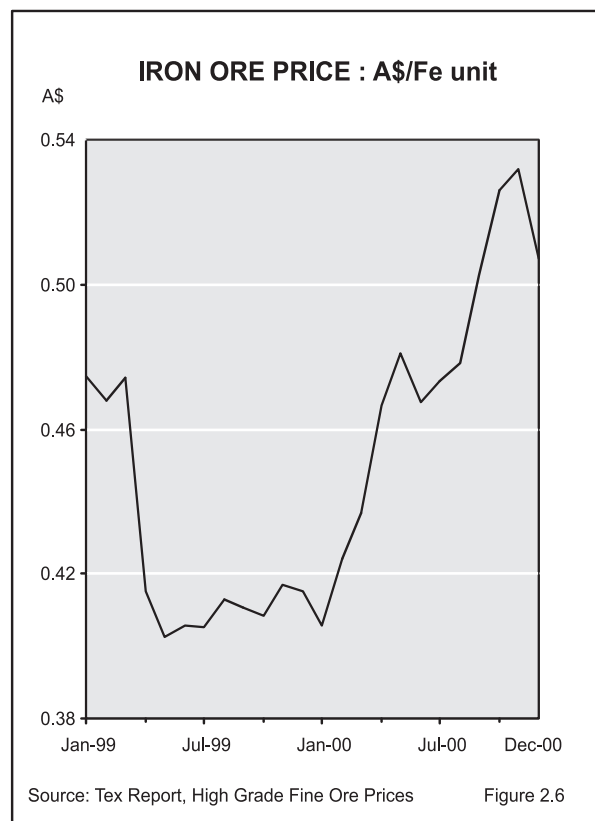
Iron ore contract negotiations for the Japanese fiscal year (April 2001 to March 2002) were settled with the Japanese steel mills in March 2001, with WA's iron ore producers agreeing to a price increase of 4.3% for iron ore fines and 3.23% on lump ore.

Iron Ore Industry Highlights for 2000

Rio Tinto defeated Anglo American in a take-over bid for North Limited during the year, despite expressions of opposition from the Japanese steel mills. The take-over has significant implications for

the WA iron ore industry as North was the 65% owner and operator of Robe River Iron Ore Associates. Under Rio Tinto the West Angelas project has the potential to be developed at a faster pace, as the operation could utilise the existing Hamersley rail infrastructure, substantially reducing the cost and time required for development of the project. However, legal action by the remaining Japanese joint venturers contesting Rio Tinto's decision not to proceed with the rail link between West Angelas and Port Lambert as originally planned, has the potential to delay the project timing. At the time of writing the project was scheduled to commence production in June 2002.

In other developments January 2001 saw the announcement of a deal between BHP and Korea's Pohang Iron and Steel Co Ltd (POSCO) for the joint development of the iron ore mine at Mining Area C in the central Pilbara region. The development is to exploit Marra Mamba ore that will be used to complement POSCO's future iron-making requirements. The feasibility study to scope the nature of the development and determine the level of capital expenditure required for mine



construction, as well as supporting rail and port infrastructure is expected to be completed by mid-2001.

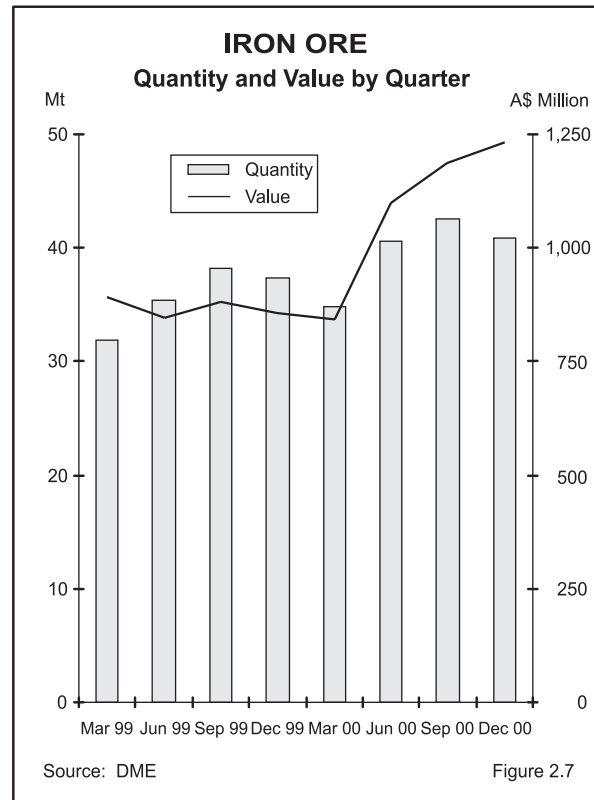
The \$420-million Hope Downs Iron Ore project was granted major project facilitation status by the Federal Government in August 2000, giving the project a streamlined decision-making process for necessary government approvals. The project is expected to get commitment to proceed in late 2002, with the mine becoming operational in 2004.

In late 2000 the BHP Board announced that it would continue with the development and operation of the HBI Plant in Port Hedland, although the project will still be subject to strict technical and financial performance hurdles in its ramp-up to required profitability by 2003 and full production of 2.3 million tonnes a year in 2007. The State has extended assistance to BHP in the form of a royalty and rental relief package worth about \$11 million to assist with the continuation of the project.

Around this time Portman Limited also moved to reinforce its long-term growth focus in the iron ore industry by announcing plans to divest its interest in the Lithgow Silicon Project and by cancelling plans to move into the plantation timber industry. These key moves leave Portman as a focussed iron ore group aiming for a major expansion of its Koolyanobbing iron ore operations from current levels of 2.5 to 8 million tonnes per annum.

Final environmental approval was given in early November 2000 to deepen the harbour at Esperance as part of an extensive upgrade being carried out by the Esperance Port Authority. The port upgrade is a vital element in the expansion of the Koolyanobbing project with the first larger capacity vessel carrying over 68,000 dead weight tonnes (dwt) leaving the port in early 2001. Previously vessels were restricted to 50,000 dwt. The second phase of dredging, together with provision of a new berth, shiploader and conveyors, will see the Esperance Port able to load vessels of up to 180,000 dwt in late 2001.

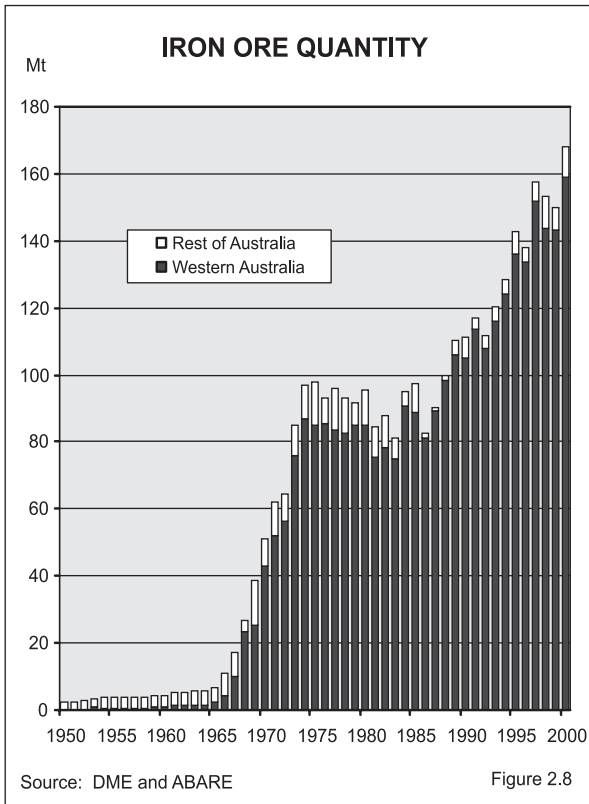
Expansion activities also included the opening of an additional storage facility at Esperance in July



2000, followed by the delivery during the year of an additional 50 new railway wagons to facilitate operation of a 3-train, 64-car operation. An additional 80 ore cars of a new lighter weight design have been ordered to allow railings in excess of 3.5 million tonnes during 2001. Portman is Australia's third largest iron ore producer and has been exporting to a range of Asian customers for a number of years. Portman is also undertaking an extensive exploration program on its new iron ore mining tenements at Bungalbin, Mount Jackson and Windarling, with mining from these areas scheduled to commence in 2002.

Outlook

Hopes for the establishment of a fully integrated steel plant in the Pilbara region took a blow in February 2001 with the announcement by Austeel that it would move the project to Newcastle which will see the development of a \$2-billion electric arc furnace. Western Australia will retain the development of the \$3-billion mining and first-stage processing project to produce hot briquetted iron. Austeel plans to mine the Fortescue iron ore deposit and process it on site into 4.62 million tonnes a year



of hot briquetted iron, which will then be transferred by conveyor to a new port at Cape Preston, 80 kilometres south of Dampier and shipped to Newcastle.

ABARE (March 2001) has forecast world iron ore consumption to increase marginally in 2001, by 2 million tonnes to 1,124 million tonnes, with most of this increase going to DRI facilities. World seaborne trade is anticipated to increase by around 4 million tonnes to 458 million tonnes in 2001, with growth in steel production in east Asian markets over the medium term likely to underpin a projected jump to 495 million tonnes in 2006.

World iron ore production is expected to increase by 9 million tonnes to 1,126 million tonnes in 2001, and increase by 70 million tonnes in the five years to 2006, in line with the positive outlook for blast furnace and DRI production. Australian iron ore exports in 2001-02 are expected to remain steady at 161 million tonnes. These forecasts are based on an expected fall in exports to Japan being offset by increased export volumes to other markets in China, Korea and Chinese Taipei. Over the longer term the projected rise in iron ore supplies is expected to be

sourced primarily from Australia and Brazil, which together account for over 65% of the world's iron ore exports.

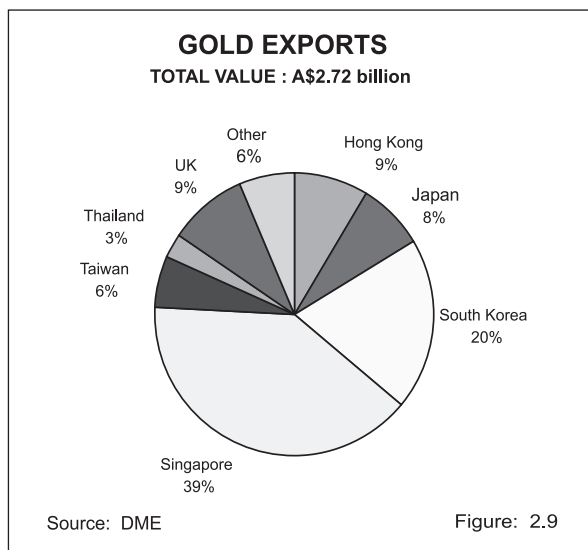
2.4 Gold

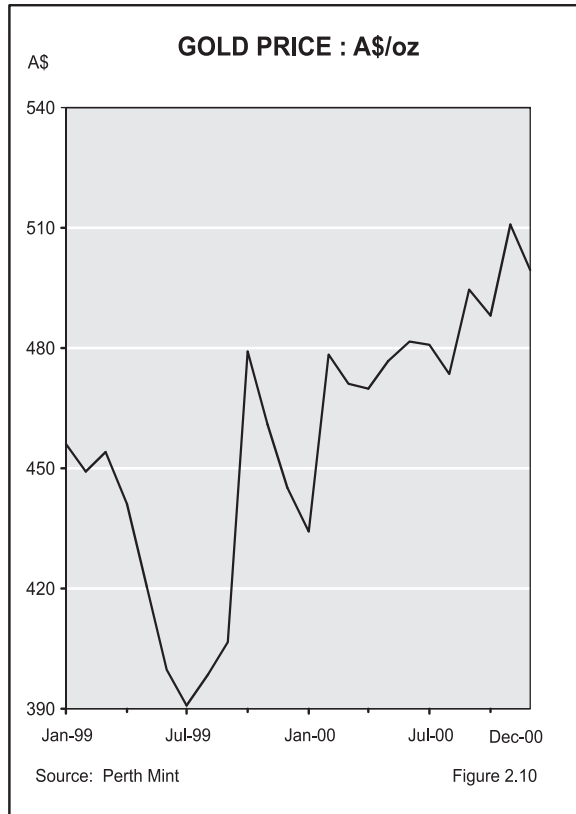
The gold sector continued to experience adverse market conditions throughout 2000, with further weakness in the US\$ gold price adding to the rationalisation and amalgamation of operations within the industry.

In 2000 the quantity of gold sold fell by 6% to 199 tonnes. The major 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 Newcrest's Telfer mine among a number of other projects as a result of increased operating costs and depleted reserves.

A 10.7% increase in the average A\$ gold price during 2000 largely offset the fall in sales volumes to help the gold industry achieve an increase of 4.7% in the value of sales for the year. Western Australia continues to produce around three-quarters of Australia's gold output.

The international gold price continued to average around US\$279 per ounce, down slightly from the previous year. More significantly this figure was down by 5% on the 1998 average and 16% lower than the 1997 average price of US\$331 per ounce.





In 2000 the value of the State's gold exports totalled A\$2.72 billion. Major gold markets included Singapore (39%), South Korea (20%), Hong Kong (9%), United Kingdom (9%) and Japan (8%).

Gold Industry Highlights for 2000

Around 53% of Western Australia's gold output in 2000 originated from the following 10 projects:

- ◆ Golden Mile/Super Pit (Normandy, Homestake) - 25.66 tonnes
- ◆ St Ives (WMC) - 12.7 tonnes
- ◆ Granny Smith (Placer Dome, Delta Gold) - 12.24 tonnes
- ◆ Jundee-Nimary (Normandy) - 11.17 tonnes
- ◆ Kanowna Belle (Delta Gold) - 9.34 tonnes
- ◆ Plutonic (Homestake) - 7.76 tonnes
- ◆ Boddington (AngloGold, Newcrest, Normandy) - 7.12 tonnes
- ◆ Sunrise Dam (AngloGold) - 7.02 tonnes
- ◆ Agnew (WMC) - 6.52 tonnes
- ◆ Bronzewing (Normandy) - 6.15 tonnes

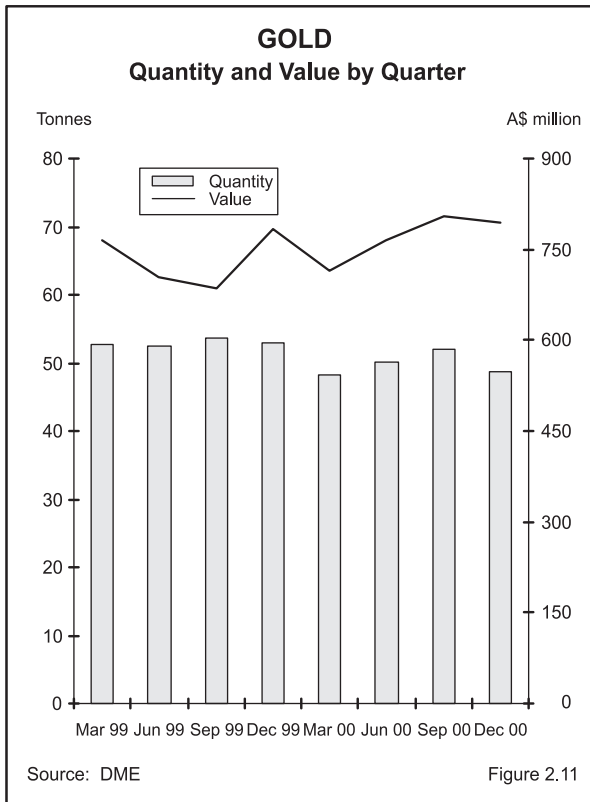
The last two years have seen a fall in the US\$ gold price which has prompted the gold mining industry in Western Australia to undergo some rationalisation of gold processing facilities and other common assets, together with a degree of corporate restructuring. Take-over activity within the gold sector has intensified over the past year with AngloGold of South Africa acquiring Acacia Resources, Normandy Mining acquiring Great Central Mines, and Harmony Gold Mining taking control of New Hampton Goldfields.

As a result of these activities within WA and throughout the rest of Australia, the industry has seen a reduction in average production costs over the recent period, declining from an estimated A\$350 per ounce in 1996 to A\$318 per ounce in 2000. These cost reductions together with the recent upturn in the Australian dollar gold price (as a consequence of the depreciations in the Australian dollar) have acted to boost average industry cash margins in 2000 to a similar level as that experienced in 1995, before the major decline in gold prices.

World Gold Market

For the past decade the world gold market has been in deficit with the annual gold supply from mine production (plus recycled gold) being substantially lower than annual consumption of gold in fabrication of new jewellery and other gold products. However this deficit has continued to be met by sales from gold stocks, with the major participants involved in such sales being central banks and private investors. Accordingly whilst this deficit has continued to increase, changes in gold price have essentially been dependent both on the changes in fabrication demand and mine supply, and on the impact of the deficit on net annual gold sales from stocks.

The 30% fall in average annual gold prices from 1996 to 1999 was largely a result of an acceleration in central bank gold sales. The increase in central bank sales from an average of 191 tonnes per year in the decade to 1995, to 491 tonnes in 2000, has added to world supply but it has also added to market expectations of further sales. This has led to



significant change. World gold mine production is expected to fall by less than 1% in 2001 from 2,568 tonnes in 2000. Fabrication consumption is expected to increase by less than 1% over a similar period from 3,743 tonnes in 2000. This supply shortfall has been 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.

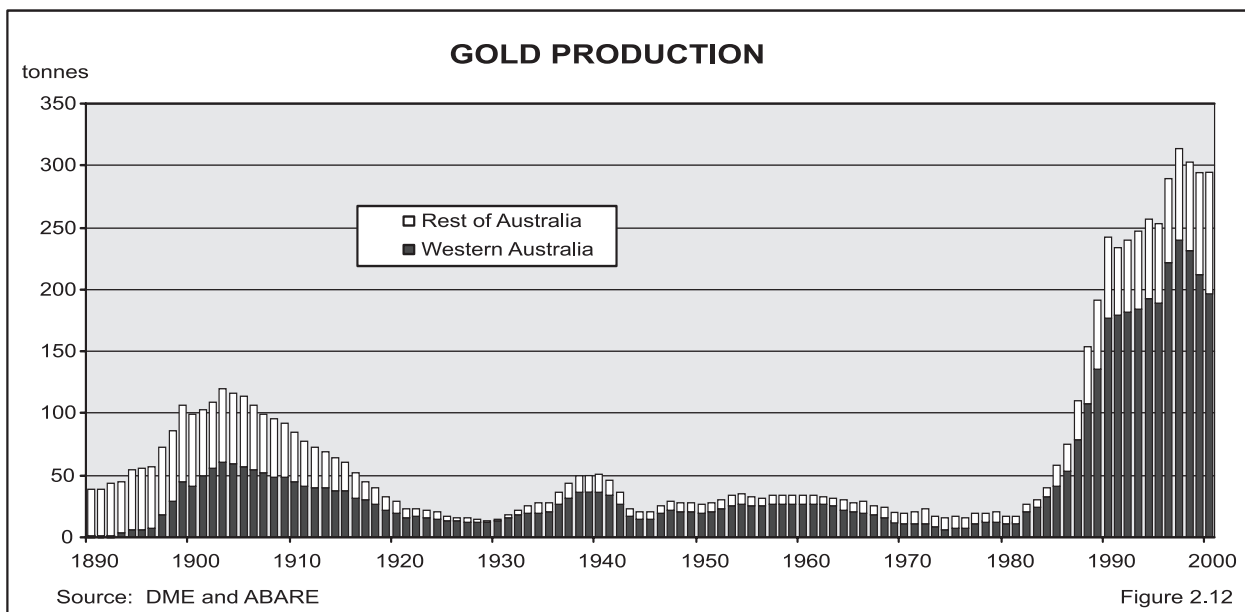
The September 1999 agreement by European banks is expected to help limit the increase in official sector sales in 2001, although they are expected to increase gradually over the medium term. However hedging activity is expected to increase to more normal levels after the sharp decline in 2000. Given the above factors, ABARE anticipates that the average price of gold will be around US\$260 per ounce in 2001.

increased forward selling by producers and private disinvestment, magnifying the effects of these official sector sales.

ABARE forecasts (March 2001) indicate that in the short term, gold fabrication consumption and mine production are not expected to experience

Outlook

Despite the forecasts for continued subdued US dollar gold prices, expectations for a sustained weak Australian dollar in 2001 and 2002 look set to result in gold prices remaining high to local producers. These prices are expected to moderate significantly over the longer term with an anticipated strengthening of the Australian dollar against the US dollar.



On the local scene the industry is expected to be boosted by the construction of the new Carosue Dam Gold Mine, located 110 kilometres north-east of Kalgoorlie, by PacMin Mining Corporation Limited in November 2000 (two months ahead of schedule). Commissioning of the plant is well advanced and it is expected that the mine will achieve full gold production targets by year-end. The project is expected to have a life of approximately 10 years.

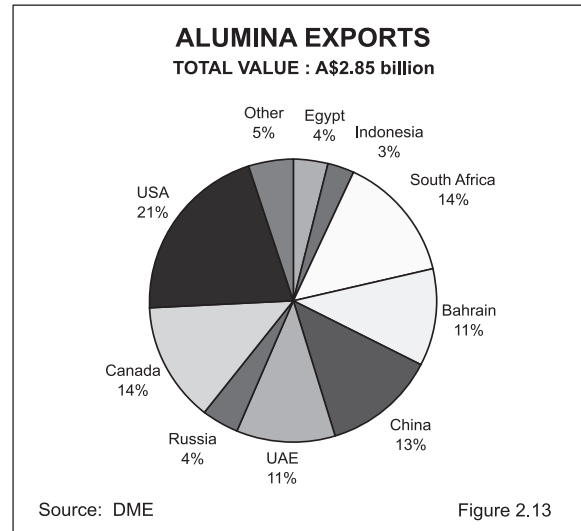
At the time of writing, finalisation of the feasibility study into the Boddington Expansion was imminent with project approval a possibility by the end of 2001, assuming receipt of all regulatory approvals. The expansion would take the project up to throughput of more than 22 Mtpa, with gold production in excess of 500,000 ounces per annum at a cash cost of below A\$300 per ounce.

The Granny Smith joint venture approved the development of the Wallaby deposit in 2000, which will add at least eight years of new mine life to the operation. Production from Wallaby is expected to come on-stream in 2002. The Sunrise Dam megapit expansion is also expected to provide a boost to the State's gold output extending the life of the existing operations by over three years and contributing an extra 260,000 ounces of production from 2002.

Despite these anticipated developments scheduled to commence production during the course of 2001 and 2002, the closure of Telfer is expected to continue to have an impact with the State's gold output expected to again fall slightly during 2001, before increasing in the medium to longer term as these expansions take effect. Nationally, ABARE (March 2001) has also forecast that Australia's gold production will fall slightly during 2001 and in future years as some operations exhaust their reserves.

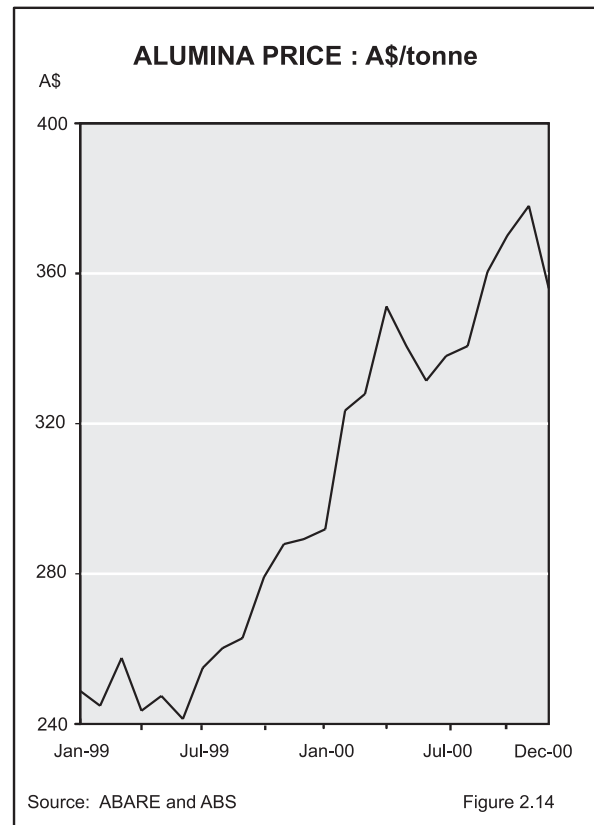
2.5 Alumina

Western Australia produces 18% of the world's alumina and accounted for over 60% of Australian production in 2000. A significant majority (just under 90%) of the State's alumina is exported. Principal destinations were the USA (21%), South



Africa (14%), Canada (14%), China (13%), Bahrain (11%) and United Arab Emirates (UAE) (11%).

The State's alumina industry set sales records in 2000, with volumes increasing by 12% to 10 Mt and the value of sales increasing by a remarkable 38% to \$3.18 billion. This strong performance is even more significant given that in calendar year 1999 the value of sales fell by 5%.



This increase in the value of sales largely reflects higher Australian export prices for alumina as a result of strong world growth in consumption of primary aluminium during 2000. Increased spot prices over the earlier part of the year enabled Australian alumina producers to negotiate an increase in their long-term contract prices to around 13.5% of the LME aluminium price, up from an average of 13% over previous years.

Alumina Industry Highlights for 2000

The \$800-million expansion of the Worsley alumina refinery, completed in September, increased its capacity by 65% from 1.8 million tonnes per year to 3.1 million tonnes. This upgrade makes the refinery one of the world's largest producers, allowing it to reduce operating costs to well under US\$100 per tonne, and improve product quality. Resources analysts consider that the upgrade is set to make Worsley the lowest-cost alumina producer in the world.

Billiton now has a controlling stake in Worsley after acquiring the 56% interest held by US-based Alcoa

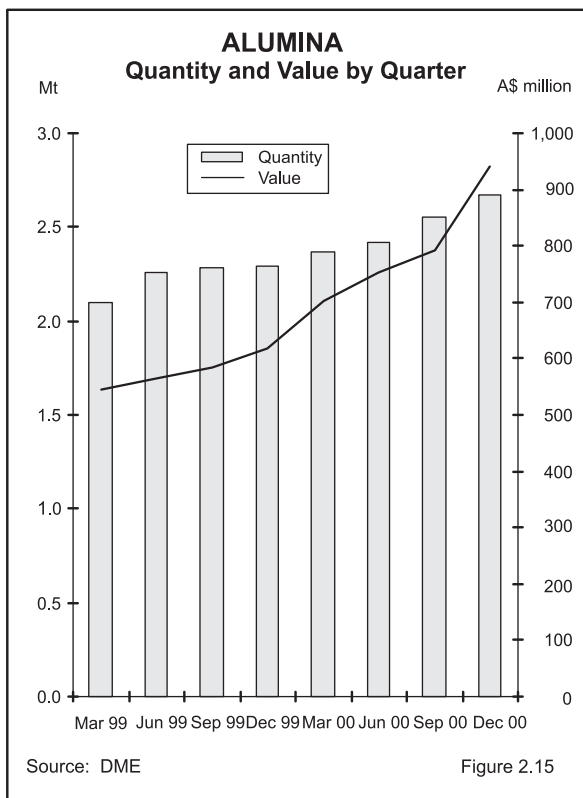


Figure 2.15

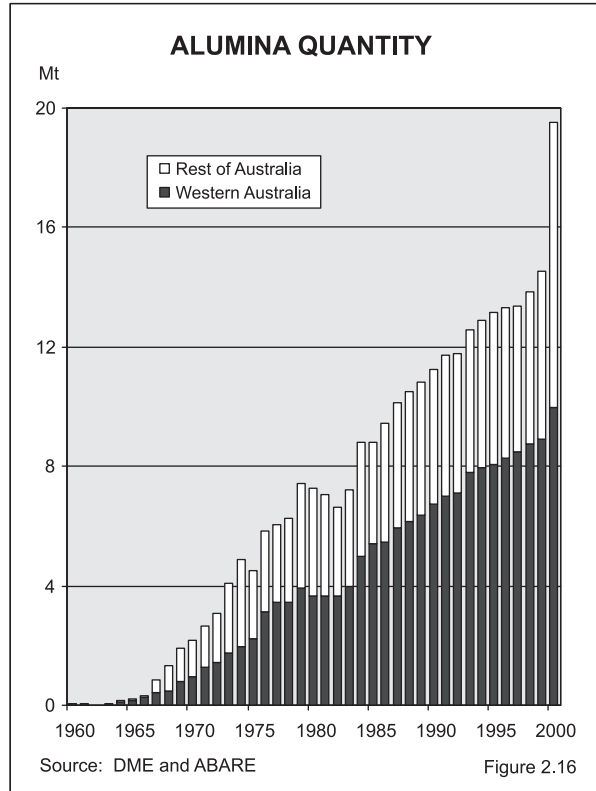


Figure 2.16

Inc in August 2000 taking its interest to 86%. Alcoa was forced to divest itself of Worsley, along with other alumina assets overseas to satisfy US and European anti-trust laws following its take-over of US-based Reynolds Metals Co.

Outlook

Recent economic information concerning a slowing in the US and Japanese economies suggests that the outlook for alumina over 2001 will be subdued, with at best only modest growth in export volumes projected.

An energy crisis in the US north-west is threatening the complete shut down of the region's aluminium industry, with 80% per cent of capacity already lost as a result of increased electricity prices. The Bonneville Power Administration (BPA), the major energy supplier in the region, has asked aluminium producers to close their smelters for two years, or face a 250% to 300% hike in electricity charges when new supply contracts come into force in October 2001.

The recent significant cuts in aluminium production in North America as a result of increased electricity prices should partially offset the effects of slowing world demand and provide some support for world aluminium prices, and prevent a sharp reduction in alumina prices. An assumed continued low Australian dollar will also help to boost export earnings in Australian dollar terms. However, it must also be recognised that the US is a major export destination for Western Australia's alumina production, and accordingly these cuts in aluminium production will be likely to have a significant effect on the two producers based in this State.

In the face of this slowing demand Alcoa has indicated that it intends to defer the incremental expansions at its Kwinana and Pinjarra refineries. A decision on the planned third unit at the Wagerup plant to lift production to 3.3 million tonnes per year, has been deferred until mid-2001.

2.6 Nickel

After falling by 15% in 1999, the quantity of Western Australian contained nickel metal sold increased by 25.9% to approximately 153,500 tonnes in 2000. Increased prices during the earlier part of the year on the back of increasing demand from stainless steel manufacturers in the northern hemisphere saw the value of sales increase by 107% to \$2.24 billion.

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

Approximately \$2.3 billion worth of nickel was exported in 2000. The main export destinations were Finland (24%), Japan (22%), USA (9%) and Netherlands (8%).

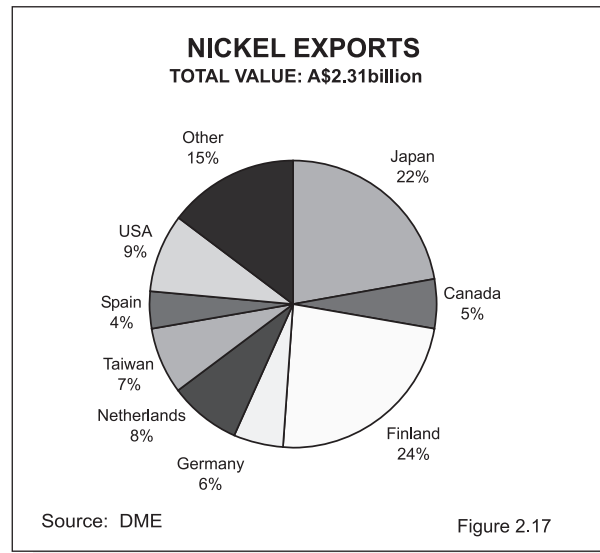
Nickel Industry Highlights for 2000

After increasing in the first three months of 2000 and remaining stable in April and May, LME nickel prices fell steadily in the second half of the year as a result of the significant easing in demand for primary nickel. The LME nickel price averaged US\$6,999 per tonne in January 2001, the lowest

monthly average since August 1999. To put this in context, it should be noted that nickel prices increased strongly in 1999-00 to average US\$8,257 per tonne, up by a massive 85% on 1998-99. This fall in prices reflects a stalling in industrial production and associated demand for stainless steel from Japan together with a slowing in the US economy, coinciding with an increased availability of stocks (both through increased production and non-official sources) in response to the earlier strengthening in prices.

The significant increase in Western Australia's nickel output in 2000 was largely driven by stronger production from WMC's operations, together with the coming on-stream of the three new nickel laterite projects (Cawse, Murrin Murrin and Bulong) which are now gearing up to full capacity production. On a combined basis nickel metal sales from these laterite projects totalled almost 24,000 tonnes of nickel metal in 2000, compared with just under 4,000 tonnes in 1999. The continued development of these projects together with a number of other planned project expansions looks set to support continued future increases in these sales volumes, contingent on world demand.

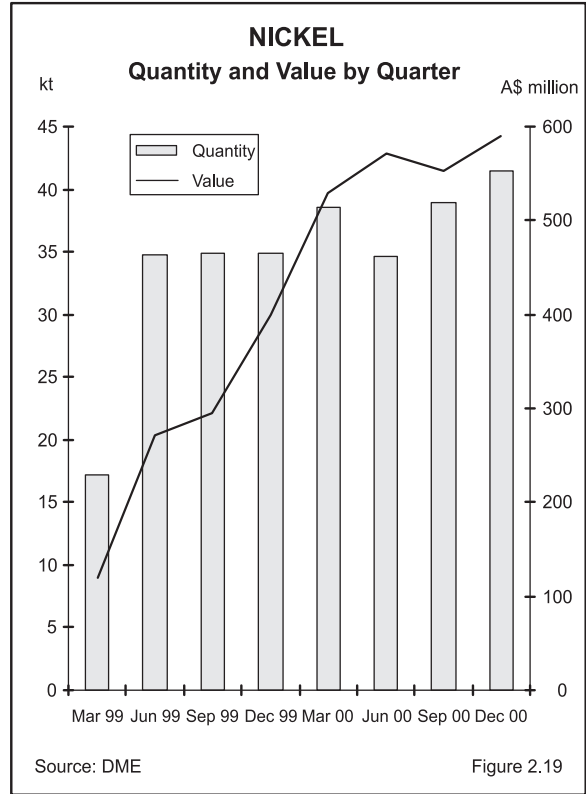
Research into the treatment of nickel laterite ores also progressed during the year with the opening of a new ore pilot testing plant in Kewdale. The pilot plant was commissioned to optimise the process configurations for the Ravensthorpe project



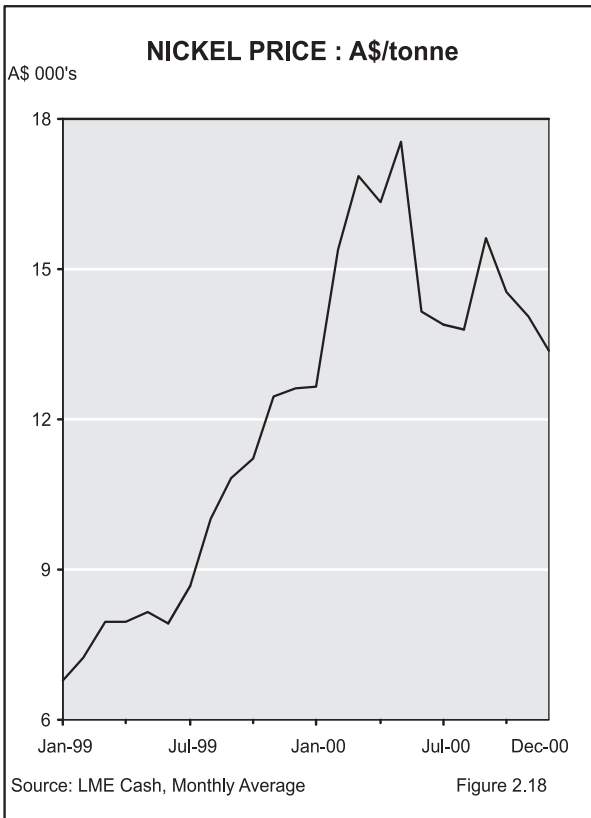
and will provide leading-edge test facilities for the other new laterite nickel deposits within WA awaiting development.

The Cawse plant was commissioned in October 1998 and reached design capacity in May 2000 producing 707 tonnes of nickel and 111 tonnes of contained cobalt for the month with a cash operating cost below US\$2.00 per pound, ahead of the planned ramp-up schedule and possible expansion of the Stage 1 development. This expansion will be reliant on a resolution of the financial position of Centaur Mining and Exploration Limited.

In September 2000 Anaconda Nickel Limited announced its Three Nickel Province Strategy reflecting the sealing of a strategic alliance between Anaconda and a number of companies including Goldfields Limited, Homestake Gold of Australia Limited and Centaur Mining and Exploration Limited. This alliance enables Anaconda access to the world's biggest nickel resource with a target of over 4 billion tonnes of nickel laterite. The strategy with each province able to host integrated processing facilities capable of producing in excess of 100,000 tonnes



of nickel is based on the Mount Margaret project, the Murrin Murrin and Cawse operations.



Improved nickel prices in the early part of the year also prompted the purchase of the lease block containing the Miitel, Mariners and Redross mines in Kambalda by a consortium of Mincor Resources NL (76%), Clough Mining Pty Ltd and Donegal Resources Pty Ltd (each 12%), from WMC with a view to their commissioning and commencing production in early 2001. Operations at the Miitel nickel mine commenced in February 2001.

WMC's Kwinana nickel refinery increased production of nickel metal to achieve an annual output of 60,532 tonnes for 2000, the highest ever achieved by the refinery.

Titan Resources also announced the successful development of the BioHeap process used for the biological recovery of nickel from base metal sulphide ores, with a large-scale pilot plant constructed and operating adjacent to Titan's Radio Hill underground mine, near Karratha. Titan has also received a \$1.9-million Commonwealth

Government Research and Development Start Grant to assist in the funding of the final phase of field development trials.

Following significant technical difficulties since the completion of the Bulong plant, located in Kalgoorlie, Preston Resources was forced to give its US bondholders, headed by London bank Barclays, a 95% stake in the project. This move to ease financial pressure on Preston Resources was in response to the company's problems in generating sufficient revenue to cover cash costs, but being unable to generate enough profit to clear all past financial obligations.

Outlook

Reflecting the recent slowing in industrial production from the major world economies ABARE (March 2001) has forecast world nickel consumption of just over 1.1 million tonnes in 2001, up marginally on 2000, before a further slight increase to just under 1.2 million tonnes in 2002. ABARE anticipates that the rate of growth in demand for stainless steel will slow in 2001, in line with the

expected continued low growth in industrial activity.

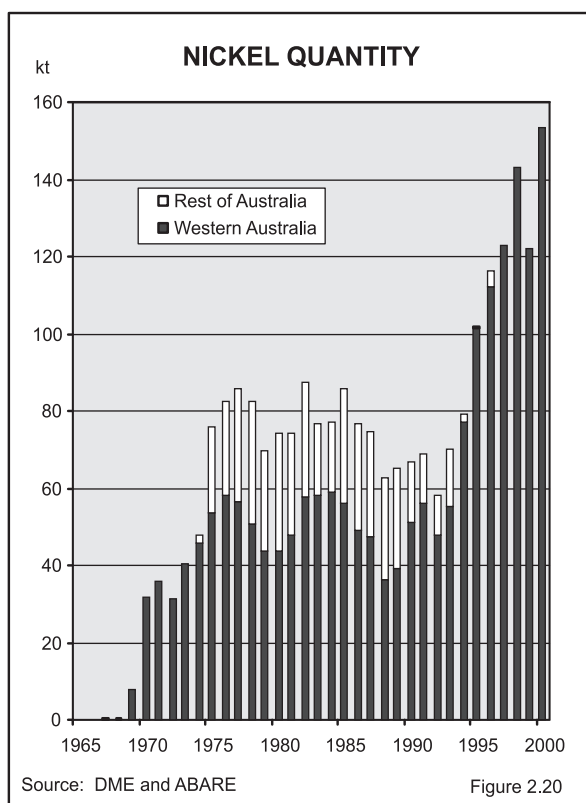
World nickel production is forecast to increase marginally in 2001 to 1.14 million tonnes and to 1.19 million tonnes in 2002, as a result of scaling up of production in Western Australia and overseas.

On an overall basis, ABARE has estimated that the nickel price will fall further in 2001 to average US\$6,700 per tonne as demand continues to weaken in line with the assumed continued slowing in world economic activity. Prices are expected to show a modest improvement over the latter half of the year with expectations of a slight increase in demand on the back of a projected strengthening in world stainless steel production.

Subject to any improvements in world economic conditions, Western Australia is well placed to supply any increase in nickel demand with the new nickel laterite projects gearing up to full capacity. WMC is also to expand the capacity of its Kwinana nickel refinery to reach 67,000 tonnes per annum (from its current capacity of 61,000 tonnes per annum) by the end of 2001.

LionOre Australia (Nickel) Ltd announced in December 2000 that it would proceed with the development of the Emily Ann nickel sulphide project, located 540 kilometres east of Perth, with the mine scheduled to come on-stream by the end of 2001. The mine will use an on-site nickel sulphide concentrate plant with an annual throughput of 250,000 tonnes of ore producing an average of 6,700 tonnes of nickel per year. The discovery of a high grade resource containing 46,000 tonnes of nickel from Cosmos Deeps could see underground development start by mid-2001 at the Cosmos nickel mine, 40 kilometres north of Leinster. This development would more than double the life of the present project that came on-stream earlier in the year, increasing its mine life to seven years.

WMC has also announced its proposal to launch a full feasibility study on a \$300-million expansion of its Mount Keith nickel operation, near Leinster. The planned 50% expansion would push nickel output



to 70,000 tonnes a year from its current capacity of 45,000 tonnes. WMC also commenced the acquisition for the Yakabindi nickel project north of Leinster from Rio Tinto in early 2001. The project adjoining the company's North Six Mile deposit (located near the Mount Keith nickel operation) has the potential to contribute 292 million tonnes at 0.52% nickel to WMC's existing nickel resources. WMC also announced in May the potential of the West Musgrave discovery located near the Western Australia, Northern Territory and South Australian borders.

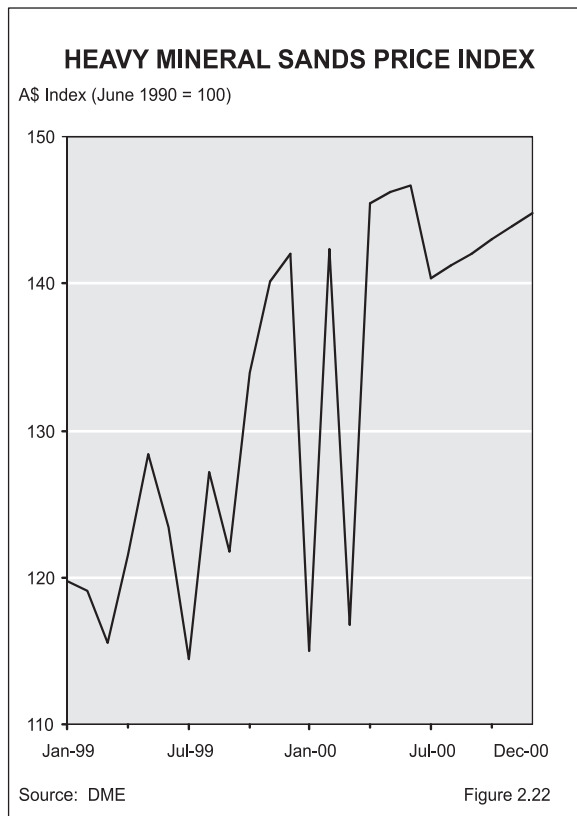
2.7 Heavy Mineral Sands

In 2000 the value of sales for the State's heavy mineral sands industry increased significantly (by 24.7%) to over \$858 million.

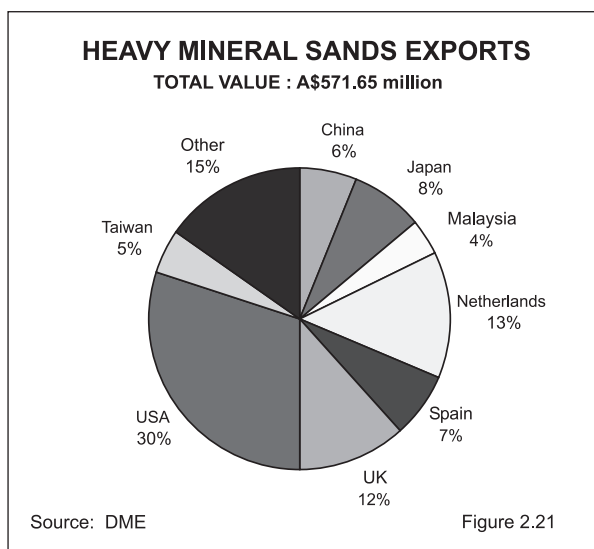
Around 67%, or \$572 million worth, of the State's mineral sands products were exported during the year. The predominant export markets were the USA (30%), Netherlands (13%) and the United Kingdom (12%).

Heavy Mineral Sands Industry Highlights for 2000

Ilmenite, rutile and leucoxene are the most commercially important sources of naturally occurring titanium. The difference between the



minerals is the amount of contained titanium dioxide when concentrated. They are primarily used as feedstock for the manufacture of titanium dioxide pigment. It has been estimated that pigment production accounts for approximately 90% of the world's consumption of titanium minerals. Ilmenite is the dominant source of titanium dioxide and when upgraded to synthetic rutile (which contains a higher proportion of titanium dioxide), it is utilised as an improved feedstock in the production of pigments.



Rutile is also an important source of titanium dioxide and is the preferred feedstock in titanium metal production. According to end-use patterns, approximately 65% of titanium metal is utilised by the aircraft and aerospace industries (more specifically in aircraft frames and engines). Other end-uses include chemical processing, power generation, marine, weapons and medical applications. Leucoxene is primarily utilised in the production of fluxes for welding rods in addition to metallurgical flux in steel and iron making. Rutile and leucoxene are also used as feedstocks for pigment production.

Zircon is recovered as a co-product from many titanium mineral operations. Zircon demand has been growing steadily, largely due to recognition of its special properties as an opacifier in ceramic glaze, which is the most significant market for zircon. Garnet is a generic name referring to a group of silicate minerals that have differing composition, colour, hardness and applications. As a naturally occurring hard material, garnet is predominantly used as an abrasive in applications including grinding, high-pressure cutting, industrial cleaning and maintenance.

The largest sector (by value) of the State's mineral sands industry is upgraded ilmenite (synthetic rutile). In 2000 this sector performed well with quantities of upgraded ilmenite increasing by 15.7% to come in at around 605,000 tonnes and a significant 29% increase in value to \$373 million.

The quantity of ilmenite sold during the year increased by 8% to over 1.3 million tonnes, with its sales value increasing by 21% to over \$185 million. This increase was supported by a 5% increase in average ilmenite prices received (in Australian dollar terms).

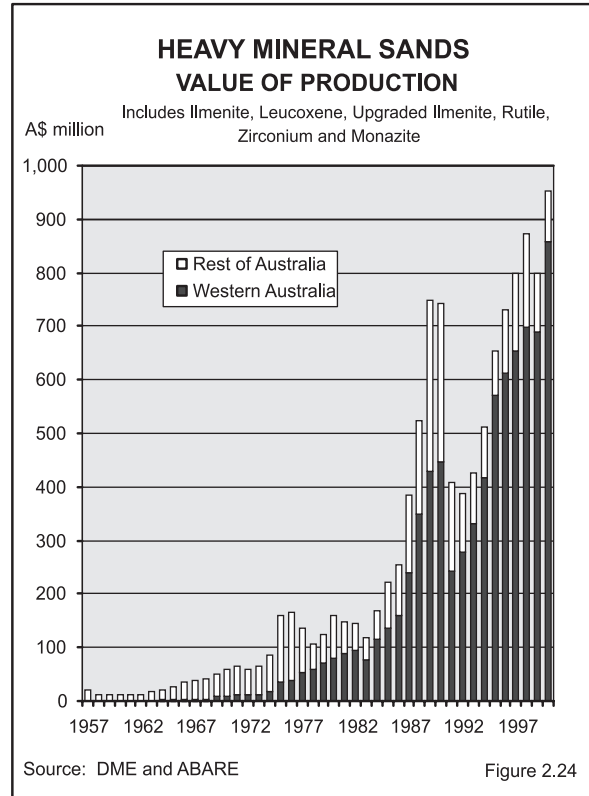
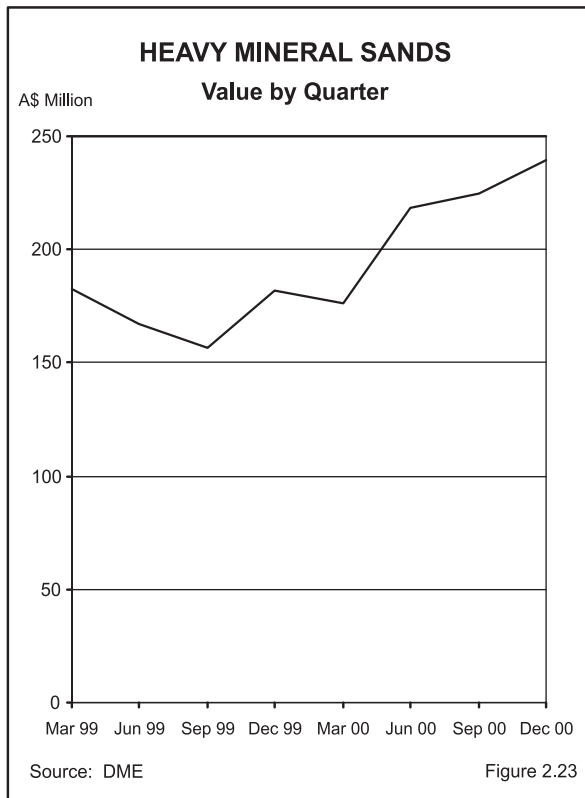


Figure 2.24

Zircon sales quantities increased by almost 8% during 2000 to 348,000 tonnes with the sales value increasing by almost 24% largely as a result of increased prices received (in Australian dollar terms).

Leucoxene sales were up by 20% to almost 38,000 tonnes with the sales value increasing by a similar proportion. The value of garnet sales in 2000 fell by around 12% to just under \$11 million, despite an increase of almost 2% in the quantity of garnet sold during the year.

Iluka Resources completed work on a second Eneabba mine in August at a cost of \$35 million, boosting its production of synthetic rutile. The associated concentrator and plant commenced production in September improving the efficiency and profitability of the Eneabba mineral field. Iluka also commissioned a fourth mine in the southern region, the North Capel West mine, in January 2000.

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 North America, Europe, and Asia to a lesser extent. Demand from these areas remains strong despite the global economy showing signs of slowing.

The titanium minerals - synthetic rutile, rutile and ilmenite - are attracting strong interest from titanium dioxide and pigment manufacturers, and these strong market conditions are expected to continue throughout 2001.

Demand for zircon is expected to continue to grow over the immediate future with anticipated increases in European ceramic sector consumption. Greater consumption of zircon sand is also expected to come from China where it is used for ceramic applications, TV glass and for zircon chemical production.

World production is expected to stay in balance with supply, with recent increases in Australian production being offset by lower than expected output from South Africa and the United States. This continued market tightness should see prices rise higher over the short term. Recent price increases have reflected precautionary buying in anticipation of likely shortfalls in world production.

Cable Sands (WA) Pty Ltd proposes to commence mining of mineral sands from ore deposits near Gwindinup in 2001 with the new mine spanning a life of up to 10 years. Cable Sands also proposes to start open cut mining operations at the Tutunup deposit (located about 14 kilometres south of Capel) in mid-2002.

Gunson Resources has also defined several mineral sands deposits in its Coburn Project, located near Shark Bay and exploration drilling of these areas will continue in 2001. Magnetic Minerals is also on track to upgrade the resource estimate for its Dongara mineral sands project with recent drilling confirming the significance of these deposits. Magnetic Minerals is also expected to add to future production of mineral sands products with the acquisition of BHP's

former Mindarra Springs project north of Perth in February 2001. This acquisition gives the company a significant holding in the North Perth basin with a defined resource in these acquired tenements of 22.4 million tonnes of heavy minerals, including ilmenite, zircon and rutile.

The main competition in Australia for mineral sands is likely to come from the Murray Basin in Victoria, with Iluka Resources announcing a 1.7 million tonne, or 28%, increase in indicated reserves in April 2000.

2.8 Diamonds

In 2000 the value of diamond sales rose by 11.5% to over \$713 million, breaking previous records despite an 18% fall in the volume of sales to 42.3 million carats.

Diamond Industry Highlights for 2000

The Argyle Diamonds project (the State's sole diamond producer) has continued to fare well over the recent period compared with the slump experienced in most parts of the gem market due to weaker demand from Asia. Argyle supplies about 37% of the world's diamonds and has forged a significant position in the Indian diamond cutting industry and the US jewellery market through its marketing arm Argyle Diamond Sales (ADS), formed in 1996 after Rio Tinto and Ashton Mining withdrew from the De Beers' Central Selling Organisation.

Over 90% of Argyle's diamonds are processed in India in the world's largest diamond cutting centre. Rough sales are supported by the ADS representative office in Mumbai. The polished diamonds business specialises in the processing of pink diamonds with the best stones being polished in Perth and the remainder by toll processing overseas.

Demand for Argyle's diamonds has continued to exceed supply and this is reflected in the increased value of sales for the year despite lower production. The lower AK1 diamond production from the Argyle

project reflected the lower grade of ore processed, in line with expectations and as a result of pit development work. Lower alluvial diamond production similarly reflected lower plant throughput and lower ore grades.

Rio Tinto acquired ownership of Ashton Mining in November 2000 (and as a result full control of the Argyle Diamonds project) following a rival bid by De Beers, which stalled after failing to secure clearance from the Foreign Investment Review Board. De Beers was unprepared to meet a number of conditions that would have cleared the way for its bid to proceed and later withdrew its bid.

In late 2000 a dispute arose between Kimberley Diamond Company and Argyle Diamonds, over Kimberley's actions in pegging and lodging exploration licence applications over the Ellendale deposits. These areas are covered by the *Argyle Diamond (Argyle Diamond Mines Joint Venture) Agreement Act 1981*. Kimberley challenged the decisions of the then Minister for Mines, Norman Moore and the then Minister for Resources Development, Colin Barnett to grant Argyle Diamonds an extension of the tenement rights over these areas under the Agreement.

Whilst this matter was before the Supreme Court, Kimberley Diamonds reached an agreement with Argyle Diamonds for the purchase of the rights to these areas for \$23.5 million. Kimberley has recently announced a preliminary development timetable for the Ellendale Diamond project. It plans to complete a final feasibility study on the proposed integrated mining and processing operation (in conjunction with its own nearby Blina project) by June 2001, with a view to launching production as early as November 2001.

During the year De Beers conducted a review of its operations in response to falling growth in diamond sales with the Central Selling Organisation being disbanded and replaced by the Diamond Trading Company, aimed at streamlining the rough diamond marketing system. It also created a new brand known as "The Forevermark" to become the focus

of a global advertising program to boost diamond sales.

Outlook

Future prospects for the world diamond industry remain encouraging with demand outstripping supply, despite the release of a considerable volume of stones from the De Beers stockpile. Global production has increased by six times since 1950 to 125 million carats per year. Some industry observers have forecast that this output could surge to 160 million carats by 2008 in response to increased demand. The London-based *Mining Journal* recently reported that retail diamond sales in the US rose by 8% to US\$36 billion in 1998 (the latest year for which figures are available). This represented an increase of nearly 70% in seven years.

A more recent indication of the strengthening in world markets was the increase in De Beers' sales, up by 44%, in the first half of 2000 compared with a similar period in 1999.

The development plans for the Ellendale Diamond Project as outlined above, follow encouraging early exploration results confirming that the diamondiferous pipes in the Ellendale Mining Area have a higher than average grading. Kimberley has also commissioned the construction of a 750,000-tonne-per-annum diamond recovery plant for the project. The acquisition of the deposit positions Kimberley to develop Australia's only locally-owned diamond mining operation.

Prospects for a further expansion of WA's diamond industry have also been enhanced by the move early this year with Diamond Rose signing De Beers as a joint venture partner in its new subsidiary, Kimberley Rose. Under the joint venture deal De Beers will contribute \$10 million, earning it a 51% interest in the first of seven projects being planned by Kimberley Rose in the Central Kimberley region. De Beers is also expected to contribute capital required for the construction of the mine when the project is developed. Confirmation drilling for the project will take place over the course of 2001.

2.9 Other Minerals

Base Metals

World base metals consumption increased strongly in 2000, by over 4%, with particular growth in consumption from the United States, Western Europe and in some parts of Asia, on the back of strong industrial production and export demand. ABARE forecasts (March 2001) indicate that this consumption is expected to grow by a more modest 1.9% in 2001 as a result of slower economic and industrial production growth in the United States and other OECD countries.

The total value of the State's base metals increased by an impressive 38% to over \$389 million in 2000. The most significant contributors to this result were increases in copper and zinc sales, with a smaller increase in lead sales.

The quantity of Western Australian zinc sold in 2000 was up by 35,000 tonnes, or 16%, to over 257,000 tonnes. The value of zinc sales increased by an impressive 32%, or \$70 million, to \$289 million. This was primarily the result of increased sales volumes coupled with a stronger zinc price, increasing by an average of 16% during the year (in Australian dollar terms). This increase in sales volumes was a result of increased production from Western Metals' Lennard Shelf mining operations, which offset a slight fall in sales from Normandy's Golden Grove mine.

The copper sector also made a strong contribution to base metal sales with the quantity increasing by 23% and the value of sales up by 62% to \$74.8 million. This increase was largely a result of a strengthening in copper prices which were up by 15% for the year on the back of stronger demand from Western Europe, the US and particularly China where net copper imports increased by 35% over the first half of the year. Increased sales volumes were also supported by across-the-board increases in output from producers, with a significant increase in sales as a result of the expansion of the Straits Resources' Nifty project. In December 1999 the company completed a feasibility study to examine the expansion of the current operation from 16,500 to 25,000 tonnes per annum, based on a revised

mineral resource estimate completed in December 1998.

The quantity of lead sales in 2000 was up 32% from 1999 to 73,080 tonnes, following a 40% increase in the previous year. The value of sales increased by 50% during the year on the back of these increased sales volumes and increased prices over the earlier part of 2000.

Coal

In 2000 the quantity of coal sold by the State's two coal producers, Wesfarmers and Griffin, fell marginally to 6.2 million tonnes with an associated 3.8% fall in the value of sales to \$257.8 million. All of the State's coal supplies are sold on the domestic market, with the vast majority being used by Western Power for electricity generation.

Salt

The quantity of salt sold fell by 14.5% during the year with an associated 7.3% fall in the value of sales to just over \$197 million. This reduction in sales volumes is largely a reflection of the continued effects of cyclone damage incurred earlier in the year.

The State's salt industry is likely to be bolstered over the coming years with the phased expansion of the Shark Bay Salt operations from 800,000/900,000 tonnes annually to 1.6 million tonnes per annum. The Onslow Salt project is also expected to make a significant contribution over future periods. Whilst construction of the 2.5 Mtpa salt field at Onslow and associated plant, jetty and infrastructure has been completed, the impact of Cyclone Vance in March 1999 with extensive damage to the pond embankments will delay salt production until the first half of 2001.

Tantalum and Spodumene

In 2000 the quantity of tantalum sold increased by 51% to 611 tonnes, with a market value of \$96.8 million, up 51.7% on the previous year. Improved world demand for tantalum, particularly associated with its use in telecommunications and electronic

equipment, such as mobile phones, has seen prices move to between US\$250 and US\$300 per pound on the open market. Sons of Gwalia (the sole producer in the State) is the largest producer in the world, and after locking-in significant forward sales contracts has recently announced that it will spend \$100 million to expand its tantalum facilities at the Greenbushes and Wodgina mines to increase capacity to 2.75 and 1.8 million tonnes per annum respectively. Commissioning of the expanded facilities is planned for the first quarter of 2002.

The State's tantalum industry is also set to receive a boost with the development of the Bald Hill project, about 70 kilometres south of Kalgoorlie-Boulder, which is set to come on-stream by mid-2001, producing about 145,000 pounds of tantalum pentoxide annually. This follows the negotiation of a licence agreement between Haddington International Resources and Sons of Gwalia. Haddington is also set to commence a feasibility study into the development of the Cattlin Creek deposit located near Ravensthorpe, with construction of a 200,000-tonnes per annum plant to produce about 180,000 pounds of tantalite per annum.

In further developments, US-based Kemet Corporation has signed a joint venture agreement with Australasian Gold Mines to develop its tantalum deposits located at the Dalgara project, 80 kilometres north-east of Mount Magnet. The initial stage will see the construction of a pilot plant to test processes for development of a concentrate product.

Spodumene sales, also sourced from Greenbushes, increased by 21% to around 65,500 tonnes in 2000 with a market value of over \$16 million.

Vanadium

In 2000 sales of vanadium pentoxide were 2,695 tonnes with a value of over \$17 million. The \$121-million Windimurra vanadium mine and processing plant, located 100 kilometres south-east of Mount Magnet, has the capacity to produce 7,200 tonnes of vanadium pentoxide a year which represents 12%

of world production. The project was developed through a joint venture between Precious Metals Australia and Xstrata AG, an affiliate of Glencore International. Windimurra is currently Australia's only operating vanadium project.

3. EXPLORATION, INVESTMENT AND EMPLOYMENT

3.1 Mineral Exploration

The mineral exploration figures released by the Australian Bureau of Statistics (ABS) indicate that mineral exploration expenditure for Western Australia fell to \$420 million in 2000, down by 2% on the 1999 level of \$430 million. These results can be 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 in the early part of 2000.

In making comparisons of ABS data for the year 2000 with previous data it should be noted that the value of exploration expenditure excludes the goods and services tax (GST) which came into effect on 1 July 2000. The GST replaced the wholesale sales tax which was included in the value of exploration expenditure estimates for periods up to the June quarter 2000.

The overall result for 2000 is not surprising given the recent spate of record low commodity prices, 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 achieved in recent years with record expenditure of \$701 million in 1997 and expenditure of \$620 million in both 1996 and 1998. From 1989 to 1995 exploration expenditure averaged around \$386 million.

Western Australia accounted for around 62% of total Australian mineral exploration expenditure of \$676 million in 2000, a slight increase from the 60% share held in 1999.

Depressed gold prices in US\$ terms continued to impact on the State's exploration effort in the sector with expenditure falling by 4% to \$260 million in 2000. It was therefore the dominant factor behind the overall fall in the State's exploration expenditure. Gold accounted for 62% of Western Australia's mineral exploration in 2000, down from 63% in 1999. The State received 70% of Australia's total gold

exploration funds in 2000, up from 67% in 1999. Exploration expenditure on base metals in Western Australia (by ABS definition - copper, silver-lead-zinc, nickel and cobalt), increased by around 15% from \$79 million to \$91 million in 2000. The 2000 expenditure accounted for 55% of Australia's total base metals exploration, up from 50% in 1999.

Most of this expenditure was on nickel prospects, with more modest expenditure on silver-lead-zinc exploration. Copper exploration expenditure has remained largely stagnant over recent periods.

The State recorded iron ore exploration expenditure of \$19 million in 2000, however comparison of this figure with the 1999 result of \$24 million is difficult, as the ABS published expenditure for only three quarters in both years. State diamond exploration expenditure in 2000 totalled \$24 million, down by 14% from the 1999 level of \$28 million. Western Australia accounted for around 82% of Australia's total diamond exploration funds, down slightly from 83% in 1999. Activity was mainly centred in the Kimberley region.

Given the limited coverage of data released by the ABS for the iron ore and mineral sands sectors, no comments can be made on exploration activities in these areas.

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

3.2 Petroleum Exploration

According to the ABS, the State's petroleum exploration expenditure in 2000 increased by 10% to \$550 million, compared to \$500 million in 1999. National expenditure dropped by 2% from \$817 million in 1999 to \$799 million in 2000. Western Australia's share of Australia's petroleum exploration expenditure increased from 61% in 1999 to 69% in 2000. The amount quoted includes expenditure on Western Australian leases located within Area B of the Zone of Cooperation with East Timor.

This increase in exploration activity within Western Australia reflects the effects of a recent strengthening in oil prices and a continuation of recent growth in exploration. The year 2000 saw an overall rise in drilling activity in Western Australia when compared to the 1999 figures. Exploration drilling rose from 38 wells in 1999 to 50 wells in the year 2000, however extension and development wells remained almost constant at 5 and 20 respectively, compared to 5 and 21 in 1999.

The State's petroleum exploration activity in 2000 was largely concentrated in the Carnarvon Basin, followed by the Browse and Bonaparte Basins. In terms of the national total, 19% of exploration expenditure was devoted to production leases in 2000, up from 15% in 1999. 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 2000, compared to 85% 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".

3.3 Mining Investment

ABS private new capital expenditure statistics for 2000 indicate that mining accounted for 42% of Western Australia's total investment, compared to 50% in 1999. Total State investment decreased by 22% from the 1999 level of \$6.07 billion to \$4.7 billion in 2000. The actual level of mining investment in Western Australia was \$1.95 billion in 2000, down by 35% on the 1999 amount of \$3.01 billion.

In 2000, Western Australia accounted for 43% of national mining investment of \$4.5 billion. This compares to the 1999 outcome when Western Australia accounted for 49% of Australia's mining investment of \$10.5 billion.

ABS mining investment figures, however, need to be treated cautiously as they do not capture all mining investment. The ABS utilise narrow classifications excluding many downstream processing activities.

3.4 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.

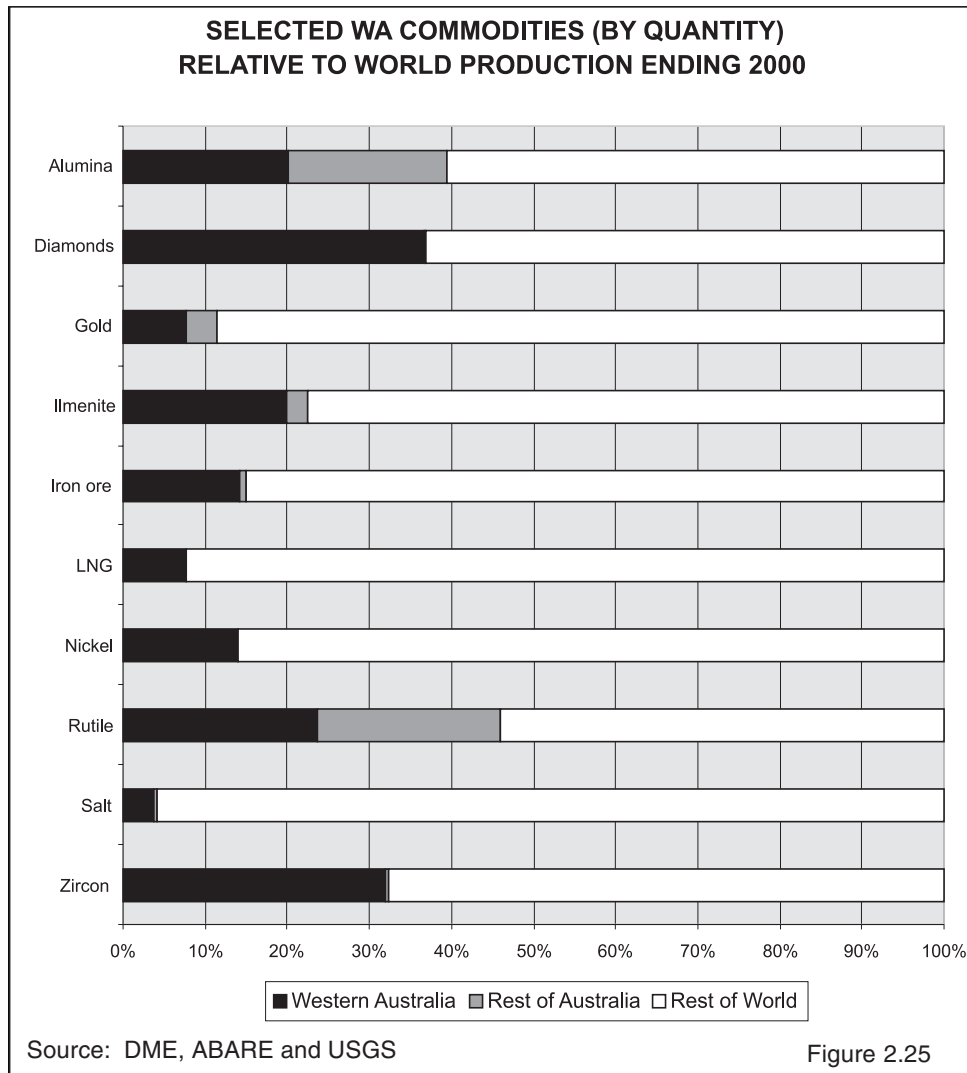
In 2000 employment in the State's mineral and petroleum industries decreased by 3% to 40,308 persons.

Of the major sectors to record increases, employment rose by 10% in the base metals sector due to the expansion of the Straits Resources' Nifty copper project. An increased amount of activity on the Argyle Diamonds project saw an increase of 27% in employment in this sector. Increased activities in a number of iron ore operations also saw employment for the sector increase by 5% during the year.

Completion of expansion activities within a number of operations in the alumina industry saw employment in the sector fall by 12% during the year. Similarly the effects of increased rationalisation within the gold sector saw employment in the industry fall by 11% during 2000.

A 19% 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. Falls in employment were also recorded in the nickel sector, down by 3% due mainly to the effects of the completion of the Murrin Murrin plant, which was partially offset by the effects of a scaling up of development activities in a number of other nickel projects. The commissioning of the Onslow salt project was largely responsible for an 8% fall in employment within the sector.

Employment in the petroleum and coal sectors remained relatively steady during the year.



The latest comparable data shows that the Western Australian share (by quantity) of the world's output of the following products was: alumina 20%, gold 8%, ilmenite 20%, iron ore 14%, LNG (World Trade) 8%, nickel 14%, rutile 24%, salt 4%, zircon 32% and diamond sales volume (mainly industrial grade) 37%.

2000 STATISTICS DIGEST

TABLE 1 QUANTITY AND VALUE OF MINERALS AND PETROLEUM

COMMODITY/Mineral	UNIT	1999		2000	
		QUANTITY	VALUE (A\$)	QUANTITY	VALUE (A\$)
BASE METALS					
Copper Metal	t	26,229	46,254,543	32,309	74,751,514
Lead Metal	t	55,281	17,225,446	73,081	25,761,448
Zinc Metal	t	222,540	219,593,277	257,712	289,000,882
TOTAL BASE METALS			283,073,266		389,513,844
BAUXITE-ALUMINA					
Alumina	t	8,930,010	2,311,377,165	10,003,058	3,187,472,430
CHROMITE					
	t	27,478	4,967,522	26,927	5,902,204
CLAYS					
Attapulgit	t	10,240 (r)	1,069,318 (r)	11,860	1,238,563
Clay Shale	t	26,615	266,150	18,785	187,850
Fire Clay	t	72,059	86,471	105,061	126,074
Kaolin	t	1,708	203,314	2,434	203,198
Saponite	t	0	0	729	49,004
TOTAL CLAYS			1,625,253 (r)		1,804,689
COAL					
	t	6,231,484	268,018,086	6,204,588	257,838,999
CONSTRUCTION MATERIALS					
Aggregate	t	294,885	2,029,283	184,081	2,023,384
Gravel	t	269,340 (r)	1,763,786 (r)	183,495	1,156,478
Rock	t	273,068	1,889,434	243,264	1,681,041
Sand	t	1,903,951 (r)	8,844,934 (r)	1,547,446	7,187,125
Sandstone	t	0	0	1,100	55,000
TOTAL CONSTRUCTION MATERIALS			14,527,437 (r)		12,103,028
DIAMONDS					
	ct	51,641,931	640,057,980 (r)	42,300,118	713,684,538
DIMENSION STONE					
Granite	t	4,732 (r)	931,700 (r)	1,439	370,610
Jasper	t	100	50,000	0	0
TOTAL DIMENSION STONE			981,700 (r)		370,610
GEM & SEMI-PRECIOUS STONES					
Agate	kg	0	0	7,186	4,312
Chrysoprase	kg	53	3,986	125	383
Emerald	kg	0.0041	10,420	0	0
Jasper	kg	6	3,600	20,742	12,445
Variscite	kg	60	36,000	40	24,054
TOTAL GEM & SEMI-PRECIOUS STONES			54,006		41,194
GOLD					
	kg	211,547 (r)	2,939,984,125 (r)	198,983 (e)	3,077,721,834 (e)
GYPSUM					
	t	1,342,505 (r)	23,279,629 (r)	1,055,231	19,185,856
HEAVY MINERAL SANDS					
Garnet	t	95,623	12,241,014	97,443	10,723,191
Ilmenite	t	1,237,485	152,947,445	1,335,903	185,466,127
Upgraded Ilmenite (a)	t	862,839 (r)	288,013,090	998,144	372,703,749
Leucoxene	t	31,528	13,887,830	37,849	16,550,625
Rutile	t	113,401	82,261,111	122,147	100,575,286
Zircon	t	322,940	139,138,916	347,933	172,107,391
TOTAL HEAVY MINERAL SANDS			688,489,406		858,126,369
INDUSTRIAL PEGMATITE MINERALS					
Feldspar	t	44,073	1,734,040	62,631	2,448,552

2000 STATISTICS DIGEST

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

COMMODITY/Mineral	UNIT	1999		2000	
		QUANTITY	VALUE (A\$)	QUANTITY	VALUE (A\$)
IRON ORE					
Domestic	t	7,015,521	188,894,160	5,780,878	163,634,792
Exported	t	135,989,777 (r)	3,328,272,950 (r)	153,084,739	4,201,552,721
TOTAL IRON ORE		143,005,298 (r)	3,517,167,110 (r)	158,865,617	4,365,187,513
LIMESAND-LIMESTONE-DOLOMITE					
Dolomite	t	3,086	67,892	2,932	64,504
Limesand-Limestone	t	3,004,290 (r)	13,969,321 (r)	2,955,333	13,830,942
TOTAL LIMESAND-LIMESTONE-DOLOMITE			14,037,213 (r)		13,895,446
MANGANESE ORE	t	108,155	13,201,137	259,536	33,614,116
NICKEL INDUSTRY					
Cobalt by-product	t	1,010	37,681,102	3,257	130,148,965
Nickel Concentrate	t	790,080	1,046,218,365	856,431	1,903,610,667
Nickel Metal	t	3,801	38,741,570 (r)	23,939	339,672,398
Palladium by-product	kg	816	10,566,069	785	27,149,754
Platinum by-product	kg	90	1,700,645	171	4,976,316
TOTAL NICKEL INDUSTRY			1,134,907,750 (r)		2,405,558,100
PETROLEUM					
Condensate	kl	5,565,129 (r)	1,013,297,674 (r)	6,190,579	1,921,944,574
Crude Oil	kl	8,490,439 (r)	1,559,291,023 (r)	13,977,419	4,546,149,690
LNG	Btu 10 ⁶	387,379,300 (r)	1,486,322,840 (r)	386,761,102	2,474,632,196
LPG - Butane	t	390,075 (r)	116,548,575 (r)	450,571	233,509,561
LPG - Propane	t	260,443 (r)	81,771,643 (r)	340,625	179,135,274
Natural Gas	'000m ³	6,600,275	569,333,371	6,929,520	608,108,961
TOTAL PETROLEUM			4,826,565,125 (r)		9,963,480,256
PIGMENTS					
Red Oxide	t	331	62,890	1,000	670,441
SALT	t	9,016,440 (r)	212,742,024 (r)	7,706,517	197,315,760
SILICA-SILICA SAND					
Silica	t	92,739	927,387	92,149	921,493
Silica Sand	t	475,928 (r)	5,716,921 (r)	493,166	6,193,436
TOTAL SILICA-SILICA SAND			6,644,308 (r)		7,114,929
SILVER	kg	81,853 (r)	18,771,360 (r)	157,837	37,331,761
SPONGOLITE	t	9,292	743,045	11,407	2,355,238
TALC	t	174,308 (r)	14,049,274 (r)	179,381	14,467,388
TIN-TANTALUM-LITHIUM					
Spodumene	t	54,023	11,453,258	65,504	16,458,150
Tantalite	t	405	63,843,890	611	96,845,674
Tin Metal	t	466	3,768,893	713	6,248,086
TOTAL TIN-TANTALUM-LITHIUM			79,066,041		119,551,910
VANADIUM	t	0	0	2,695	17,493,593
TOTAL VALUE			17,016,126,890(r)		25,704,250,598

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.

- (a) Also known as Synthetic Rutile
- (e) Estimate
- (r) Revised from previous edition

2000 STATISTICS DIGEST

TABLE 2 QUANTITY AND VALUE OF SELECTED MAJOR COMMODITIES

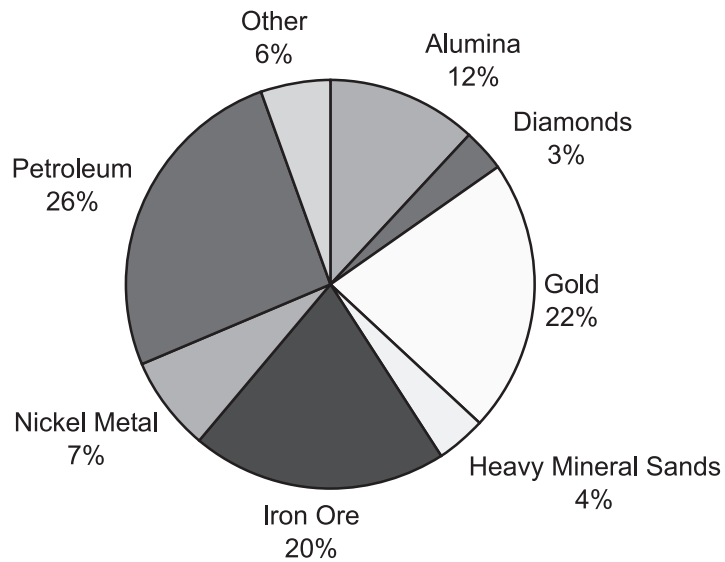
	Unit	1991		1992		1993		1994	
		Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M
ALUMINA	Mt	7.01	1,844.03	7.08	1,689.72	7.80	1,891.86	7.93	1,684.58
BASE METALS									
Copper Metal	kt	11.79	17.92	12.09	18.68	28.98	30.21	35.11	68.13
Lead Metal	kt	10.70	4.35	20.96	7.43	32.28	7.84	20.29	7.32
Zinc Metal	kt	112.01	94.69	141.39	132.98	141.10	87.02	123.62	85.14
<i>TOTAL BASE METALS</i>			116.96		159.09		125.07		160.59
COAL	Mt	5.11	228.56	5.66	251.76	5.47	248.44	5.03	234.02
DIAMONDS	M ct	33.36	456.93	41.15	565.06	22.65	486.77	27.72	470.34
GOLD	tonnes	186.34	2,800.18	182.10	2,751.38	183.47	3,139.61	192.98	3,265.93
HEAVY MINERAL SANDS									
Ilmenite	Mt	0.94	81.50	1.04	87.30	1.01	85.40	1.08	93.52
Rutile	kt	59.13	39.66	68.96	39.05	56.60	29.97	87.16	44.46
Upgraded Ilmenite	kt	330.00	168.91	376.00	177.48	375.00	174.42	453.00	208.47
Zircon	kt	204.33	79.16	265.17	51.46	299.76	46.26	444.26	99.00
Other HMS			5.14		10.26		6.49		6.62
<i>TOTAL HEAVY MINERAL SANDS</i>			374.37		365.55		342.54		452.07
IRON ORE	Mt	114.17	2,978.72	108.15	2,921.98	116.34	2,996.73	124.26	2,630.61
MANGANESE ORE	kt	209.64	37.77	402.84	72.20	247.86	43.40	202.52	22.74
NICKEL METAL	kt	55.76	569.24	48.04	461.54	55.46	437.74	77.00	630.13
PETROLEUM									
Condensate	Gl	1.87	313.74	2.06	366.70	2.17	359.86	2.34	331.19
Crude oil	Gl	5.21	901.42	5.05	917.36	4.05	709.32	8.75	1,299.75
LNG	Btu 10 ¹²	204.80	957.95	237.64	966.47	264.75	997.88	335.11	1,080.17
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	3.74	372.20	3.78	368.96	4.21	422.96	4.92	441.96
<i>TOTAL PETROLEUM</i>			2,545.31		2,619.49		2,490.02		3,153.07
SALT	Mt	6.83	149.36	6.67	155.39	6.53	159.57	6.86	153.49
OTHER			91.69		132.36		112.77		149.67
TOTAL			12,193.12		12,145.52		12,474.52		13,007.24

2000 STATISTICS DIGEST

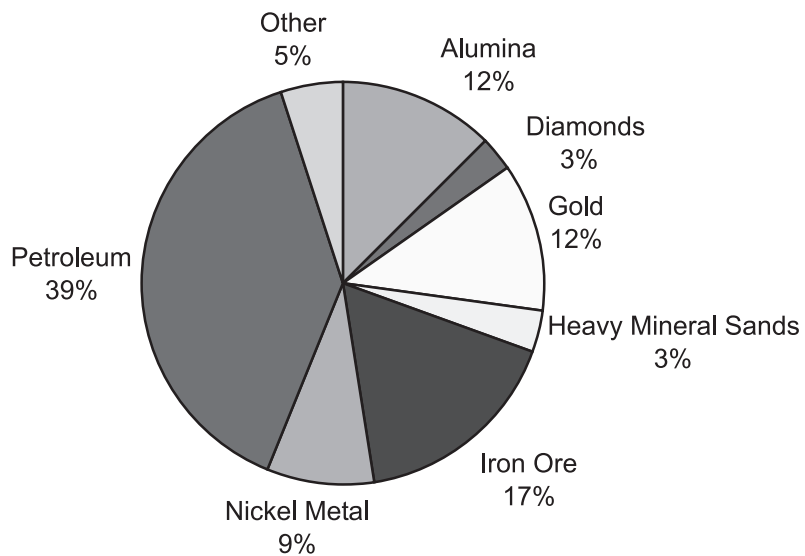
1995		1996		1997		1998		1999		2000	
Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M
8.07	1,757.36	8.25	1,967.81	8.48	2,084.71	8.75	2,429.70	8.93	2,311.38	10.00	3,187.47
24.31	73.29	23.07	51.28	28.32	62.46	28.24	57.13	26.23	46.25	32.31	74.75
15.64	8.25	17.08	9.90	23.20	9.91	39.52	15.09	55.28	17.23	73.08	25.76
126.34	87.73	106.86	71.28	117.20	118.10	149.33	127.85	222.54	219.59	257.72	289.00
	169.27		132.46		190.47		200.07		283.07		389.51
6.06	280.66	5.81	268.38	5.69	260.53	5.61	249.35	6.23	268.02	6.20	257.84
23.45	480.15	47.43	442.01	40.42	421.19	52.27	642.39	51.64	640.06	42.30	713.68
189.48	3,163.66	221.18	3,528.64	238.34	3,414.61	231.43	3,477.73	211.55	2,939.98	198.98	3,077.72
1.00	96.27	1.08	114.29	1.23	133.59	1.29	150.85	1.24	152.95	1.33	185.47
124.87	68.14	110.65	79.17	111.78	78.53	96.93	76.45	113.40	82.26	122.15	100.58
535.00	254.58	522.00	258.23	581.00	292.86	529.48	289.79	862.84	288.01	998.14	372.70
458.44	152.54	372.70	197.54	292.79	160.34	277.35	154.37	322.94	139.14	347.93	172.11
	8.07		25.26		22.86		26.13		26.13		27.27
	579.60		674.49		688.18		697.59		688.49		858.13
135.97	2,980.69	133.65	2,924.48	151.72	3,633.34	143.75	4,103.92	143.01	3,517.17	158.87	4,365.19
227.90	28.42	296.81	32.67	176.99	22.15	79.43	8.13	108.16	13.20	259.53	33.61
101.36	1,094.17	108.38	1,033.88	122.99	1,136.00	143.08	1,039.12	121.89	1,084.96	153.51	2,243.28
3.83	564.91	4.97	773.72	6.44	1,103.31	6.41	887.06	5.57	1,013.30	6.20	1,921.94
8.68	1,384.83	11.26	1,958.82	9.54	1,719.80	10.98	1,497.55	8.49	1,559.29	13.98	4,546.15
375.37	1,390.75	377.82	1,391.20	375.60	1,595.47	387.96	1,402.12	387.38	1,486.32	386.76	2,474.63
19.42	4.73	158.96	37.44	320.43	93.17	384.54	86.31	390.08	116.55	450.57	233.51
14.14	3.44	150.84	36.93	253.82	73.83	263.82	55.87	260.44	81.77	340.63	179.14
5.83	421.92	6.62	494.68	7.33	571.51	6.33	527.96	6.60	569.33	6.93	608.11
	3,770.58		4,692.80		5,157.09		4,457.20		4,826.57		9,963.48
7.29	155.81	7.21	143.61	8.12	172.12	8.48	210.17	9.02	212.74	7.71	197.32
	182.81		207.71		186.27		264.29		230.49		417.02
14,643.18		16,048.94		17,366.66		17,780.06		17,016.13		25,704.25	

5 YEAR VALUE COMPARISON

1995 Total : A\$14.643 billion



2000 Total : A\$25.704 billion



Source: DME

Figure 0.1

2000 STATISTICS DIGEST

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

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE A\$	Ref. (p. 56)
BASE METALS					
Copper By-Product	Coolgardie		Cu tonnes		
	Ravensthorpe		6,092	10,008,932	(a)
	Roebourne		54	78,980	(a)
	Wiluna		1,950	3,218,557	(a),(b)
			179	288,453	(a)
Total Copper By-Product			8,275	13,594,922	
Copper Concentrates	East Pilbara	4,676	Cu %		
	Yalgoo	16,682	48.03	5,696,596	
Total Copper Concentrates		21,358	20.94	8,565,198	(a)
Copper Cathode	East Pilbara		Cu tonnes		
Total Copper			18,296	52,591,394	
				74,751,514	(a),(b)
Lead	Derby-West Kimberley	88,677	Pb %		
	Yalgoo	5,180	76.95	23,205,125	
Total Lead		93,857	93.55	25,761,448	(a)
Zinc	Yalgoo	170,999	Zn %		
	Derby-West Kimberley	270,599	56.97	104,997,584	
Total Zinc		441,598	59.24	184,003,298	(a)
TOTAL BASE METALS				389,513,844	
BAUXITE - ALUMINA					
Alumina	Boddington	2,422,535		710,161,202	
	Murray	5,386,809		1,760,228,203	
	Waroona	2,193,714		717,083,025	
TOTAL BAUXITE - ALUMINA		10,003,058		3,187,472,430	(c),(d)
CHROMITE					
Chromite Ore	Meekatharra	74,260	Cr ₂ O ₃ %	36.26	5,902,204 (a)
CLAY					
Attapulgitite	Mullewa	11,860		1,238,563	
Clay Shale	Collie	18,785		187,850	
Fire Clay	Chittering	105,061		126,074	
Kaolin	Bridgetown-Greenbushes	2,434		203,198	
Saponite	Coorow	729		49,004	
TOTAL CLAY		138,870		1,804,689	(e)
COAL	Collie	6,204,588		257,838,999	(f)
CONSTRUCTION MATERIALS					
Aggregate	Broome	29,975		1,112,803	
	Wyndham-East Kimberley	7,255		36,275	
	Port Hedland Town	38,080		228,480	
	Roebourne	31,749		183,694	
	Wyndham-East Kimberley	77,022		462,132	
Total Aggregate		184,081		2,023,384	

2000 STATISTICS DIGEST

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

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE A\$	Ref. (p.56)
Gravel	Broome	6,066		27,375	
	Coolgardie	40,245		239,040	
	East Pilbara	3,385		16,925	
	Kalamunda	109,604		757,396	
	Kalgoorlie-Boulder	2,260		3,390	
	Port Hedland Town	773		6,887	
	West Kimberley	14,711		73,555	
	Wyndham-East Kimberley	6,452		31,910	
Total Gravel		183,496		1,156,478	
Rock	Broome	2,581		120,954	
	Dundas	17,330		220,960	
	East Pilbara	15,676		94,060	
	Kalgoorlie-Boulder	206,681		1,240,091	
	Wyndham-East Kimberley	996		4,976	
Total Rock		243,264		1,681,041	
Sand	Broome	45,100		419,860	
	Coolgardie	247,256		1,476,380	
	Coorow	3,933		19,665	
	Dandaragan	2,872		14,232	
	Derby-West Kimberley	15,714		82,173	
	Esperance	15,390		76,949	
	Kalgoorlie-Boulder	7,083		42,497	
	Leonora	3,455		20,730	
	Marble Bar	2,753		16,079	
	Meekatharra	632		3,795	
	Northam	39,045		117,134	
	Port Hedland Town	39,651		232,267	
	Roebourne	9,498		58,764	
	Wanneroo	1,106,554		4,564,054	
	Wyndham-East Kimberley	4,712		23,554	
	Yilgarn	3,799		18,992	
	Total Sand		1,547,447		7,187,125
Sandstone	Broome	1,100		55,000	
TOTAL CONSTRUCTION MATERIALS		2,159,388		12,103,028	(e)
DIAMONDS	Wyndham-East Kimberley		carats 42,300,118	713,684,538	(a)
DIMENSION STONE					
Granite	Coolgardie	263		59,630	
	Dundas	1,130		308,680	
	Roebourne	46		2,300	
TOTAL DIMENSION STONE		1,439		370,610	(e)
GEM & SEMI-PRECIOUS STONES					
Agate	Marble Bar	7,186		4,312	
	Kalgoorlie-Boulder	125		383	
Jasper	Ashburton	3,052		1,831	
	Marble Bar	620		372	
	Meekatharra	17,070		10,242	
Total Jasper		20,742		12,445	
Variscite	Carnarvon	40		24,054	
TOTAL GEM & SEMI-PRECIOUS STONES				41,194	

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

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	Ref. VALUE A\$ (p.56)
GOLD			Au kg	
	Boddington		7,118	110,045,026
	Coolgardie		21,255	329,410,297
	Cue		4,907	75,776,195
	Dundas		3,419	53,153,367
	East Pilbara		6,777	103,315,227
	Kalgoorlie-Boulder		47,720	738,129,070
	Laverton		12,272	188,578,775
	Leonora		37,613	581,941,052
	Meekatharra		16,783	260,311,870
	Mt Magnet		9,544	148,204,515
	Sandstone		3,422	53,182,031
	Wiluna		14,882	230,626,123
	Yalgoo		129	1,975,567
	Yilgarn		13,142	203,072,719
TOTAL GOLD			198,983	3,077,721,834 (g)
GYPSUM				
	Carnarvon	806,661		16,713,930
	Dalwallinu	42,082		614,076
	Dandaragan	60,472		604,720
	Dundas	23,490		157,909
	Irwin	6,729		107,668
	Kent	19,435		252,661
	Koorda	200		2,400
	Lake Grace	25,949		217,930
	Merredin	2,340		19,530
	Nungarin	19,081		114,486
	Ravensthorpe	5,250		31,500
	Wyalkatchem	43,192		345,546
	Yilgarn	350		3,500
TOTAL GYPSUM		1,055,231		19,185,856 (f)
HEAVY MINERAL SANDS				
Garnet Sand	Northampton	97,443		10,723,191
Ilmenite	Augusta-Margaret River	17,100	TiO ₂ %	2,052,000
	Bunbury City	452,451	59.39	74,242,824
	Capel	515,125	55.83	73,131,297
	Carnamah	270,279	54.48	23,606,248
	Dandaragan	80,948	59.11	12,433,758
			57.72	
Total Ilmenite		1,335,903		185,466,127
Upgraded Ilmenite	Capel	311,180	TiO ₂ %	108,879,542
	Carnamah	350,906	92.00	122,779,057
	Dandaragan	336,058	92.00	141,045,150
Total Upgraded Ilmenite		998,144		372,703,749
Leucoxene	Bunbury City	3,551	TiO ₂ tonnes	2,090,378
	Capel	17,661	1,841	7,473,665
	Dandaragan	16,637	3,262	6,986,582
Total Leucoxene		37,849	14,015	16,550,625

2000 STATISTICS DIGEST

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

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUEA\$	Ref. (p.56)
Rutile	Bunbury City	3,050	TiO ₂ tonnes		
	Carnamah	85,040	2,855	1,918,807	
	Dandaragan	34,057	80,044	73,177,270	
			27,204	25,479,209	
Total Rutile		122,147	110,103	100,575,286	
Zircon	Augusta-Margaret River	1,425	ZrO ₂ tonnes		
	Bunbury City	31,671	0	326,001	
	Capel	54,179	4,090	13,682,551	
	Carnamah	176,804	10,308	28,337,574	
	Dandaragan	83,854	29,912	89,623,898	
			14,625	40,137,367	
Total Zircon		347,933	58,935	172,107,391	
TOTAL HEAVY MINERAL SANDS				858,126,369	(a)
INDUSTRIAL PEGMATITE MINERALS					
Feldspar	Marble Bar	61,628		2,428,199	
	Mukinbudin	1,003		20,353	
Total Feldspar		62,631		2,448,552	(e)
IRON ORE					
Domestic Ore	East Pilbara	5,780,878	Fe%		
			63.06	163,634,792	
Exported Ore	Ashburton	80,578,162	61.34	2,137,258,619	
	Derby-West Kimberley	574,849	65.93	15,074,086	
	East Pilbara	70,121,670	60.97	2,006,380,415	
	Yilgarn	1,810,058	63.87	42,839,601	
Total Exported Ore		153,084,739		4,201,552,721	
TOTAL IRON ORE		158,865,617		4,365,187,513	(a)
LIMESAND-LIMESTONE-DOLOMITE					
Dolomite	Lake Grace	2,932		64,504	
Limesand-Limestone	Broome	24,067		120,335	
	Carnamah	16,579		66,316	
	Cockburn	1,744,459		5,146,155	
	Coorow	17,518		87,740	
	Dandaragan	14,739		284,717	
	Dundas	229,365		3,440,475	
	Exmouth	960		6,240	
	Gingin	36,198		577,930	
	Irwin	189,152		486,731	
	Kwinana	395,959		543,369	
	Manjimup	2,823		42,347	
	Shark Bay	1,741		243,796	
	Wanneroo	244,646		2,710,535	
	Wiluna	37,128		74,256	
	Total Limesand-Limestone		2,955,333		13,830,942
TOTAL LIMESAND-LIMESTONE-DOLOMITE		2,958,265		13,895,446	(e)
MANGANESE ORE					
MANGANESE ORE	East Pilbara	259,536	Mn%		
			48.79	33,614,116	(a)

2000 STATISTICS DIGEST

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

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE A\$	Ref. (p.56)
NICKEL INDUSTRY					
			Co tonnes		
Cobalt By-Product	Coolgardie		1,130	56,590,344	
	Kalgoorlie-Boulder		2,035	68,642,187	
	Ravensthorpe		12	705,718	
	Roebourne		64	3,384,988	
	Wiluna		15	825,728	
Total Cobalt By-Product			3,257	130,148,965	(a),(b)
			Ni%		
Nickel Concentrates	Coolgardie	148,044	12.91	271,187,426	
	Kalgoorlie-Boulder	60,397	18.99	162,382,153	
	Kondinin	24,211	11.34	35,797,406	
	Leonora	305,675	13.32	606,229,483	
	Ravensthorpe	5,341	18.46	11,114,435	
	Roebourne	46,721	10.18	65,577,558	
Wiluna	266,042	17.51	751,322,206		
Total Nickel Concentrates		856,431		1,903,610,667	(i)
			Ni tonnes		
Nickel Metal	Kalgoorlie-Boulder		23,939	339,672,398	(i)
			Pd kg		
Palladium By-Product	Coolgardie		753.34	25,911,547	
	Roebourne		31.59	1,238,207	
Total Palladium By-Product			784.92	27,149,754	(b)
			Pt kg		
Platinum By-Product	Coolgardie		170.582	4,976,316	(b)
TOTAL NICKEL INDUSTRY				2,275,409,135	
PETROLEUM					
			Kilolitres		
Condensate	Ashburton		368,886	90,980,930	
	Carnamah		157	12,634	
	Irwin		1,733	464,041	
	Roebourne		5,819,803	1,830,486,969	
Total Condensate			6,190,579	1,921,944,574	
			Kilolitres		
Crude Oil	Ashburton		4,830,623	1,525,916,703	
	Irwin		2,779	735,296	
	Roebourne		9,144,017	3,019,497,691	
Total Crude Oil			13,977,419	4,546,149,690	
			Btu 10 ⁶		
Liquified Natural Gas	Roebourne		386,761,102	2,474,632,196	
			Tonnes		
LPG - Butane	Roebourne		450,571	233,509,561	
			Tonnes		
LPG - Propane	Roebourne		340,625	179,135,274	
			'000 m ³		
Natural Gas	Ashburton		1,157,816	100,595,834	
	Carnamah		41,951	5,304,521	
	Irwin		231,304	24,592,236	
	Roebourne		5,498,449	477,616,370	
Total Natural Gas			6,929,520	608,108,961	
TOTAL PETROLEUM PRODUCTS				9,963,480,256	(d)

2000 STATISTICS DIGEST

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

MINERAL	LOCAL GOVERNMENT AREA	QUANTITY TONNES	METALLIC CONTENT	VALUE A\$	Ref. (p.56)
PIGMENTS					
Red Oxide	Cue	1,000		670,441	(a)
SALT					
	Carnarvon	1,484,154		39,546,566	(a)
	Esperance	3,139		274,086	(h)
	Port Hedland Town	2,370,506		61,060,027	(a)
	Roebourne	2,875,187		72,687,458	(a)
	Shark Bay	848,303		18,482,951	(a)
	Wyalkatchem	74		6,328	(h)
	Yilgarn	125,155		5,258,344	(h)
TOTAL SALT		7,706,517		197,315,760	
SILICA-SILICA SAND					
Silica	Moora	92,149		921,493	
Silica Sand	Swan	373,800		4,060,356	
	Albany	119,366		2,133,080	
Total Silica Sand		493,166		6,193,436	
TOTAL SILICA-SILICA SAND				7,114,929	(a)
SILVER BY-PRODUCT					
			Ag kg		
	Coolgardie		266	69,503	(a),(j)
	Derby-West Kimberley		1,259	322,495	(a),(b)
	East Pilbara		606	153,170	(a),(j)
	Roebourne		30,231	8,101,796	(a),(j)
	Statewide		30,756	7,675,684	
	Yalgoo		94,719	21,009,113	(a),(j)
TOTAL SILVER BY-PRODUCT			157,837	37,331,761	
SPONGOLITE	Plantagenet	11,407		2,355,238	
TALC					
	Meekatharra	15,677		1,097,372	
	Three Springs	163,704		13,370,016	
TOTAL TALC		179,381		14,467,388	(f)
TIN-TANTALUM-LITHIUM					
Spodumene	Bridgetown-Greenbushes	65,504	Li ₂ O % 5.45	16,458,150	
Tantalite	Bridgetown-Greenbushes	611		96,845,674	
Tin	Bridgetown-Greenbushes		Sn Tonnes 712.50	6,248,086	
TOTAL TIN-TANTALUM-LITHIUM				119,551,910	(a)
VANADIUM					
	Mt Magnet		V ₂ O ₅ tonnes 2,695	17,493,593	(f)
VALUE OF MINERALS				12,663,048,508	
VALUE OF PETROLEUM				9,963,480,256	
VALUE OF GOLD				3,077,721,834	
TOTAL VALUE				25,704,250,598	

2000 STATISTICS DIGEST

TABLE 4 ROYALTY RECEIPTS 1999 AND 2000

COMMODITY/Mineral	1999 Total A\$	2000 Total A\$	2000 Growth A\$ %	
BASE METALS				
Copper	1,505,225	2,150,692	645,467	43
Lead	1,009,237	979,297	-29,940	(3)
Zinc	10,278,218	12,941,644	2,663,426	26
TOTAL BASE METALS	12,792,680	16,071,633	3,278,953	26
BAUXITE-ALUMINA				
Alumina	39,021,615	47,244,112	8,222,497	21
CHROMITE	207,213	316,205	108,992	53
CLAYS	98,677	117,844	19,167	19
COAL	13,891,849	14,416,916	525,067	4
CONSTRUCTION MATERIALS				
Aggregate	118,276	63,990	-54,286	(46)
Gravel	85,583	56,411	-29,172	(34)
Rock	91,250	82,110	-9,140	(10)
Sand	594,599	519,676	-74,923	(13)
TOTAL CONSTRUCTION MATERIALS	889,708	722,187	-167,521	(19)
DIAMOND	53,713,094	65,775,673	12,062,579	22
DIMENSION STONE	5,002	672	-4,330	(87)
GEM & SEMI-PRECIOUS STONES	4,050	3,090	-960	(24)
GOLD	35,152,990	43,866,770	8,713,780	25
GYPSUM	491,219	387,099	-104,120	(21)
HEAVY MINERAL SANDS				
Garnet	690,440	559,346	-131,094	(19)
Ilmenite	8,651,767	9,420,018	768,251	9
Leucoxene	150,079	929,640	779,561	519
Rutile	3,768,604	4,129,129	360,525	10
taurilite	0	18	18	100
Zircon	6,857,020	7,339,194	482,174	7
TOTAL HEAVY MINERAL SANDS	20,117,910	22,377,345	2,259,435	11
INDUSTRIAL PEGMATITE MINERALS				
Feldspar	351	274,305	273,954	78,050
IRON ORE	204,971,947	232,692,930	27,720,983	14

2000 STATISTICS DIGEST

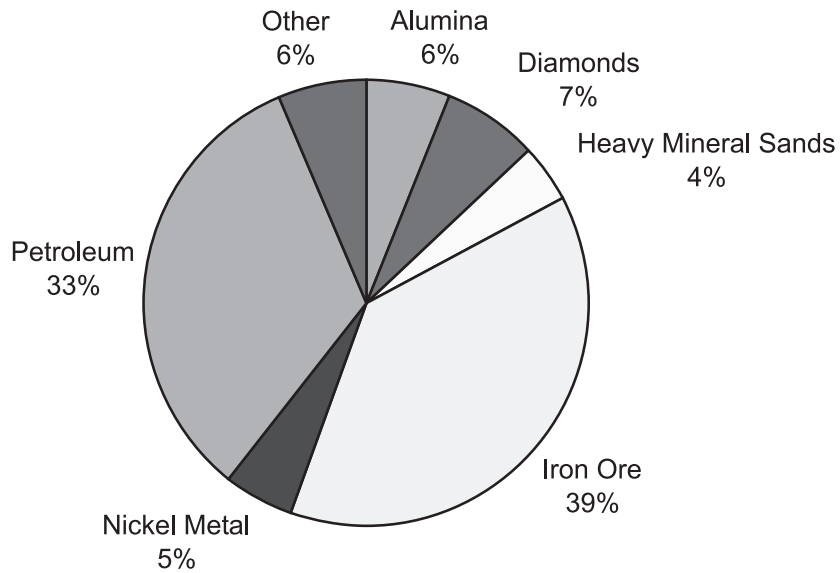
TABLE 4 (cont.) ROYALTY RECEIPTS 1999 AND 2000

COMMODITY/Mineral	1999	2000	2000 Growth	
	Total A\$	Total A\$	A\$	%
LIMESAND-LIMESTONE-DOLOMITE				
Dolomite	926	880	-46	(5)
Limesand-Limestone	1,211,764	1,463,256	251,492	21
TOTAL LIMESAND-LIMESTONE-DOLOMITE	1,212,690	1,464,136	251,446	21
MANGANESE	646,167	2,247,987	1,601,820	248
NICKEL INDUSTRY				
Cobalt by-product	694,807	1,817,804	1,122,997	162
Nickel	20,268,521	51,541,488	31,272,967	154
Palladium by-product	215,079	550,288	335,209	156
Platinum by-product	85,731	81,489	-4,242	(5)
Rhodium by-product	0	3,394	3,394	100
TOTAL NICKEL INDUSTRY	21,264,138	53,994,463	32,730,325	154
PETROLEUM				
Condensate	44,674,729	138,153,193	93,478,464	209
Liquified Natural Gas	71,228,740	162,299,921	91,071,181	128
LPG - Butane	5,545,007	16,221,723	10,676,716	193
LPG - Propane	3,871,295	12,405,602	8,534,307	220
Natural gas	26,062,759	33,691,143	7,628,384	29
Oil	38,745,701	147,952,491	109,206,790	282
TOTAL PETROLEUM	190,128,231	510,724,073	320,595,842	169
PIGMENTS				
Red oxide	3,144	33,522	30,378	966
SALT	2,139,776	1,979,850	-159,926	(7)
SILICA SAND	280,571	277,372	-3,199	(1)
SILVER	350,754	734,276	383,522	109
SPONGOLITE	25,388	115,532	90,144	355
TALC	54,776	89,769	34,993	64
TIN-TANTALUM-LITHIUM				
Spodumene	533,659	756,185	222,526	42
Tantalite	1,662,750	2,126,739	463,989	28
Tin	107,326	121,443	14,117	13
TOTAL TIN-TANTALUM-LITHIUM	2,303,735	3,004,367	700,632	30
VANADIUM	0	157,636	157,636	100
TOTAL REVENUE	599,767,675	1,019,089,764	419,322,089	70

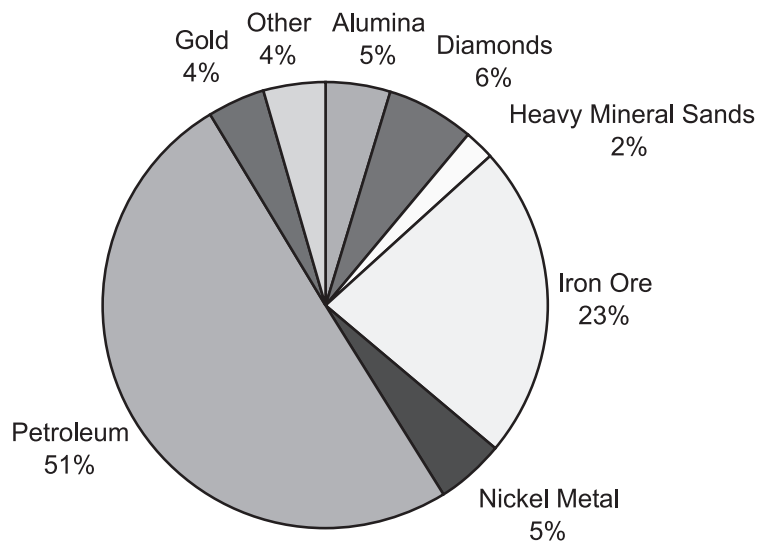
Note: All Royalty Receipts above are only those paid to the Consolidated Revenue Fund.

5 YEAR ROYALTY COMPARISON

1995 Total : A\$465.43 million



2000 Total : A\$1,019.09 million



Source: DME

Figure 0.2

2000 STATISTICS DIGEST

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

MINERAL/Company	Operating Site	1999	2000
BASE METALS			
Barmenco Pty Ltd	Elizabeth Hill	0	18
Normandy Mining Ltd	Scuddles	376	346
Straits Resources Ltd	Nifty	296	381
Western Metals Ltd	Pillara	533	586
TOTAL BASE METALS		1,205	1,331
BAUXITE - ALUMINA			
Alcoa of Australia Ltd	Huntly	471	523
	Jarrahdale	79	63
	Kwinana Alumina Refinery	1,393	1,449
	Pinjarra Refinery	1,476	1,443
	Wagerup Alumina Refinery	1,145	832
	Willowdale	241	264
Australian Fused Materials Pty Ltd	Rockingham Fused Alumina Plant	67	192
Worsley Alumina Pty Ltd	Worsley - includes Mt Saddleback	191	230
	Worsley Refinery	2,542	1,710
TOTAL BAUXITE -ALUMINA		7,605	6,706
COAL			
Griffin Coal Mining Co. Pty Ltd	Muja	341	330
Wesfarmers Coal Ltd	Premier/WCL	355	379
TOTAL COAL		696	709
DIAMONDS			
Argyle Diamond Mines Pty Ltd	Lake Argyle	742	940
GOLD			
Acacia Resources Ltd	Sunrise Dam	212	237
Australian Gold Resources Ltd	Gidgee	35	102
Australian Gold Fields NL	Bannockburn	0	8
Australian Gold Resources Ltd	Perth Mint	72	89
Barmenco Pty Ltd	Jenny Wren	25	0
	Newhaven	0	2
Centaur Mining & Exploration Ltd	Mt Pleasant - Ora Banda	391	287
Central Norseman Group	Norseman	254	255
Consolidated Gold NL	Bardoc - Davyhurst	39	0
Croesus Mining NL	Binduli	56	43
	Mayday North	0	4
	Hannan South	18	19
Delta Gold Ltd	Golden Feather Group	149	5
	Kanowna Belle	392	366
	Lady Ida	0	72
Equigold NL	Dalgaranga	148	102
Goldfields Kalgoorlie Ltd	Kundana	245	279
	Paddington	237	196
	Three Mile Hill	61	0
Herald Resources Ltd	Three Mile Hill	61	0
Hill 50 Gold NL	Hill 50 - Mt Magnet	608	378
Homestake Mining Company	Darlot	368	147
	Lawlers	205	206
	Plutonic	385	376
Kalgoorlie Consolidated Gold Mines Pty Ltd	Golden Mile - Superpit	1,089	1,155

2000 STATISTICS DIGEST

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

MINERAL/Company	Operating Site	1999	2000	
GOLD Continued				
LionOre Australia Pty Ltd	Bounty	222	231	
Lynas Gold NL	Mt Olympus	44	46	
Mount Mine Joint Venture	Mount Group	3	0	
New Hampton Goldfields NL	Big Bell	374	387	
	Dawns Hope	228	0	
	Jubilee	218	250	
	Tuckabianna	0	6	
	Newcrest Mining Ltd	New Celebration	251	234
Nickel Seekers	Telfer	605	448	
	Daisy-Milano	0	10	
Normandy Mining Ltd	Kaltails	65	6	
Normandy Yandal Operations Ltd	Bronzewing - Mt McClure	335	234	
	Jundee-Nimary	531	554	
	Wiluna	376	246	
Pacmin Mining Corporation Limited	Carosue Dam	0	120	
	Peak Hill	44	0	
	Tarmoola	280	337	
	Fortnum	98	67	
Perilya Mines NL	Granny Smith	397	439	
Placer Dome Inc	Chalice	79	9	
Resolute Ltd	Higginsville	37	3	
	Barnicoat	31	7	
Sons of Gwalia NL	Copperhead	60	0	
	Cornishman	60	0	
	Golden Pig and Frasers	58	0	
	Great Victoria Underground	0	52	
	Marvel Loch	323	342	
	Sons of Gwalia	213	217	
	Yilgarn Star	178	139	
	St. Barbara Mines Ltd	Bluebird	90	174
	Troy Resources Ltd	Bulchina - Mt Klemptz	39	42
	WMC Resources Ltd	Emu	588	634
Kambalda - St. Ives		865	903	
Boddington - Hedges		569	404	
Worsley Alumina Pty Ltd		27	10	
Other		27	10	
TOTAL GOLD		12,277	10,879	

HEAVY MINERAL SANDS

BHP Titanium Minerals Pty Ltd	Beenup	39	34
Cable Sands Pty Ltd	Bunbury	339	331
GMA Garnet Pty Ltd	Narngulu Garnet Plant	23	24
	Port Gregory - Hutt Lagoon	15	16
	Rockingham Zirconia Plant	19	32
Hanwah Advanced Ceramics Australia Pty Ltd	Capel	1,233	699
Iluka Resources Limited	Eneabba	345	297
	Narngulu Synthetic Rutile Plants	196	218
	Narngulu Dry Plant	63	63
	Chandala - Muchea	207	234
TiWest Pty Ltd	Cooljarloo	288	295
TOTAL HEAVY MINERAL SANDS		2,767	2,243

2000 STATISTICS DIGEST

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

MINERAL/Company	Operating Site	1999	2000	
IRON ORE				
BHP Iron Ore (Goldsworthy) Ltd	Finucane Island	248	239	
	Yarrie	189	186	
BHP Iron Ore (Jimblebar) Ltd	Jimblebar	104	114	
BHP Iron Ore Ltd	Mt Newman Railway	457	360	
	Mt Whaleback	1,185	1,060	
	Nelson Point	773	626	
	Mt Newman Orebody 25	99	80	
	Port Hedland HBI Plant	686	1,044	
	Yandi	269	205	
	Hamersley Iron Pty Ltd	Brockman No. 2 Detritals Group	175	219
		Dampier Port Operations	839	957
		Hismelt - Kwinana	98	77
		Marandoo	184	164
Paraburdoo - Channar		623	749	
Hamersley Railway		326	405	
Tom Price		858	937	
Yandicoogina		176	223	
Koolyanobbing Iron Pty Ltd	Cockatoo Island	30	35	
	Koolyanobbing	28	33	
Robe River Mining Co. Pty Ltd	Cape Lambert	433	449	
	Pannawonica Deepdale	301	267	
	Robe River Railway	103	112	
	West Angelas Rail	0	14	
	West Angelas Port Facility	0	33	
	West Angelas Plant	0	16	
TOTAL IRON ORE		8,184	8,604	
NICKEL				
Murrin Murrin Operations	Murrin Murrin	1,243	687	
Centaur Mining & Exploration	Cawse	288	316	
LionOre Australia (Nickel) Ltd	Emily Ann	0	4	
Outokumpu Mining Australia Pty Ltd	Black Swan	182	247	
	Forrestania	106	5	
	Bulong	253	286	
Preston Resources Ltd	Cosmos	0	111	
Sir Samuel Mines NL	RAV 8	0	73	
Tectonic Resources NL	Radio Hill	77	75	
Titan Resources NL	Kalgoorlie Nickel Smelter	708	751	
	Kambalda/Blair	428	454	
	Kwinana Refinery	407	371	
	Leinster	755	890	
	Mt Keith	772	768	
TOTAL NICKEL		5,219	5,038	

2000 STATISTICS DIGEST

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

MINERAL/Company	Operating Site	1999	2000
PETROLEUM PRODUCTS			
Apache Energy Ltd	Campbell, Agincourt, East Spar, Harriet, Rosette, Sinbad, Tanami, Stag, Chervil, North Herald, South Pepper	153	190
ARC Energy NL	Dongara	6	6
BHP Petroleum (Australia) Pty Ltd	Griffin, Buffalo	93	93
Chevron Australia Pty Ltd	Barrow Island, Cowle, Crest, Roller-Skate, Saladin, Yammaderry	202	114
Empire Oil & Gas NL	Rough Range	0	6
Kimberley Oil NL	Blina, Boundary, Lloyd, Sundown, West Terrace	4	4
Mobil Exploration & Producing Australia Pty Ltd	Wandoo	34	34
Origin Energy Resources Ltd	Beharra Springs, Tubridgi	10	10
Phoenix	Woodada	8	8
Petro Energy Pty Ltd	Mt Horner	7	3
Woodside Energy Ltd	Cossack, Goodwyn, Hermes, Lambert, North Rankin, Wanaea	739	812 (r)
TOTAL PETROLEUM PRODUCTS		1,256	1,280 (r)
SALT			
Cargill Salt Co.	Port Hedland	110	107
Dampier Salt Ltd	Dampier	249	235
	Lake MacLeod	177	211
Onslow Solar Salt Pty Ltd	Onslow	140	65
Shark Bay Salt JV	Useless Loop	80	80
TOTAL SALT		756	698
TOTAL CLAYS		55	68
TOTAL CONSTRUCTION MATERIALS		326	403
TOTAL DIMENSION STONE		72	87
TOTAL INDUSTRIAL PEGMATITE MINERALS		30	30
TOTAL LIMESTONE - LIMESAND		176	165
TOTAL MANGANESE ORE		45	83
TOTAL PHOSPHATE		187	177
TOTAL SILICA - SILICA SAND		218	195
TOTAL TALC		89	108
TOTAL TIN - TANTALUM - LITHIUM		310	287
TOTAL VANADIUM - LITHIUM		391	150
ALL OTHER MATERIALS		103	127
TOTAL		41,731	40,308 (r)

Source: AXTAT Reporting System, Mining Operations Division

(r) Revised

TABLE 6
PRINCIPAL MINERALS AND PETROLEUM PRODUCERS 2000
BASE METALS
Copper

Murchison Zinc Co. Pty Ltd, 8 Kings Park Road, West Perth WA 6005, (08) 9480 3232, Golden Grove, Scuddles, <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, Scuddles, <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, 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

Boral Resources (WA) Ltd, 63 Abernethy Road, Belmont WA 6104, (08) 9333 3400, Grosmont, <http://www.boral.com.au>
 WA Limestone Co, 41 Spearwood Avenue, Bibra Lake WA 6163, (08) 9434 2299, Pickering Brook.

Sand

Boral Resources (WA) Ltd, 63 Abernethy Road, Belmont WA 6104, (08) 9333 3400, Grosmont, <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, Marble Bar, Sullivan's Creek, Turner River, Widgiemooltha.

TABLE 6 (contd)
PRINCIPAL MINERALS AND PETROLEUM PRODUCERS 2000
DIAMONDS

Argyle Diamond Mines, 2 Kings Park Road, West Perth WA 6005, (08) 9482 1166, Argyle.

DIMENSION STONE
Granite

Allied Granites Pty Ltd, 4 Koojan Avenue, South Guildford WA 6055, Drydens Find Granite.

Mungari Quarries Pty Ltd, Level 2, 343 Pacific Highway, North Sydney NSW 2060, (02) 9957 2002, Mungari Granite.

FELDSPAR

Unimin Australia Ltd, 22-28 Tomlinson Road, Welshpool WA 6106, (08) 9362 1411, Pippingarra, Mukinbudin.

GOLD

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

Australian Gold Resources Ltd, 210 Kings Way, South Melbourne VIC 3205, (03) 9234 1166, Gidgee, <http://www.austgold.com.au>

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, Kanowna Belle, Lady Ida, <http://www.deltagold.com.au>

Equigold NL, 7 Sleat Street, Applecross WA 6153, (08) 9316 3661, Dalgarna.

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

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, Mt Olympus, <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, Big Bell, Jubilee, <http://www.newhampton.com.au>

Normandy Mining Ltd, 100 Hutt Street, Adelaide SA 5000, (08) 8303 1700, Bronzewing-Mt McClure, Jundee-Nimery, Wiluna, <http://www.normandy.com.au>

Pacmin Mining Corporation Ltd, 35 Ventnor Avenue, West Perth WA 6005, (08) 9321 0616, Carosue Dam, Tarmoola, <http://www.pacmin.com.au>

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, Great Victoria Underground, 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.

Troy Resources Ltd, 44 Ord Street, West Perth WA 6005, (08) 9481 1277, Bulchina-Mt Klemptz, <http://www.troy.com.au>

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

TABLE 6 (cont.)
PRINCIPAL MINERALS AND PETROLEUM PRODUCERS 2000
GYPSUM

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

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

Gypsum Industries, 7 Armstrong Road, Applecross WA 6153, (08) 9364 4951, Lake Cowcowing.

Quantum Holdings Pty Ltd, 15 Havelock Street, West Perth WA 6005, (08) 9321 1616, Jurien Bay North.

HEAVY MINERAL SANDS
Garnet Sand

GMA Garnet Pty Ltd, PO Box 188, Geraldton WA 6531, (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 6231, (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.

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.

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>

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

Jubilee Mines NL, 24 Outram Street, West Perth WA 6005, (08) 9213 1588, Cosmos, <http://jubileegold.com.au>

Tectonic Resources NL, Suite 4, 100 Hay Street, Subiaco WA 6008, (08) 9388 3872, RAV8, <http://www.tectonicres.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 2000
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, Campbell, Agincourt, 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>

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

Empire Oil & Gas NL, 9 O'Beirne Street, Claremont WA 6010, (08) 9385 3810, Rough Range,

www.empireoil.com.au

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

Boundary, Lloyd, Sundown, West Terrace.

Mobil Exploration & Producing Australia Pty Ltd, Level 29, QV1 Building, 250 St George's Terrace,

Perth WA 6000, (08) 9424 9200, Wandoo.

Origin Energy Resources Ltd, 34 Colin Street, West Perth WA 6005, (08) 9324 6111, Beharra Springs,

Tubridgi, <http://www.boral.com.au>

Petro Energy Pty Ltd, 242 Railway Parade, West Leederville WA 6007, (08) 9310 8989, Mt Horner.

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

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, Gngarra.

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

Unimin Australia 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

Vanadium Australia Pty Ltd, 4th Floor, 47 St George's Terrace, Perth WA 6000, (08) 9218 5900, 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
A\$	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	LME	London Metal Exchange

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

LOCAL GOVERNMENT BOUNDARIES

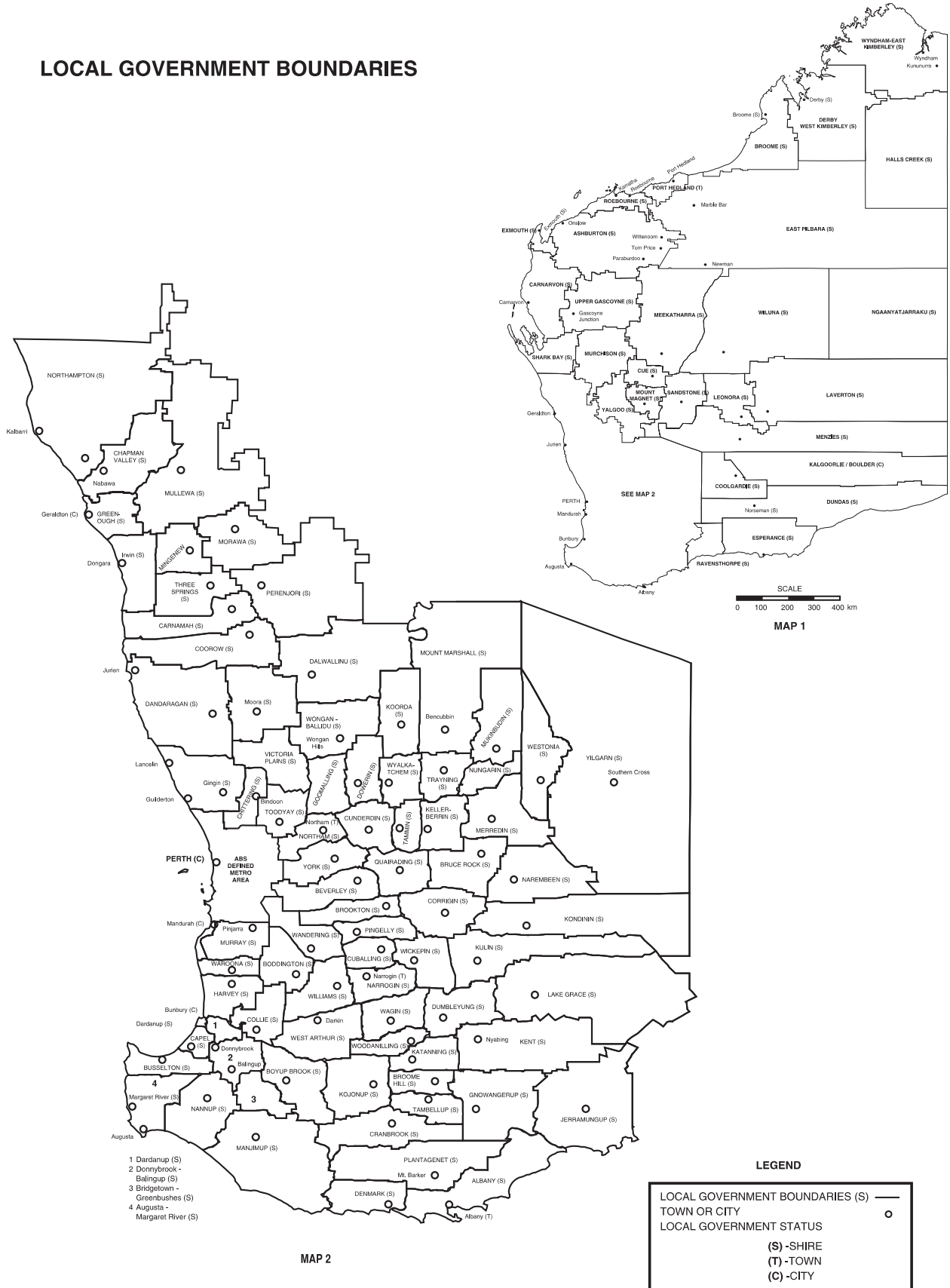
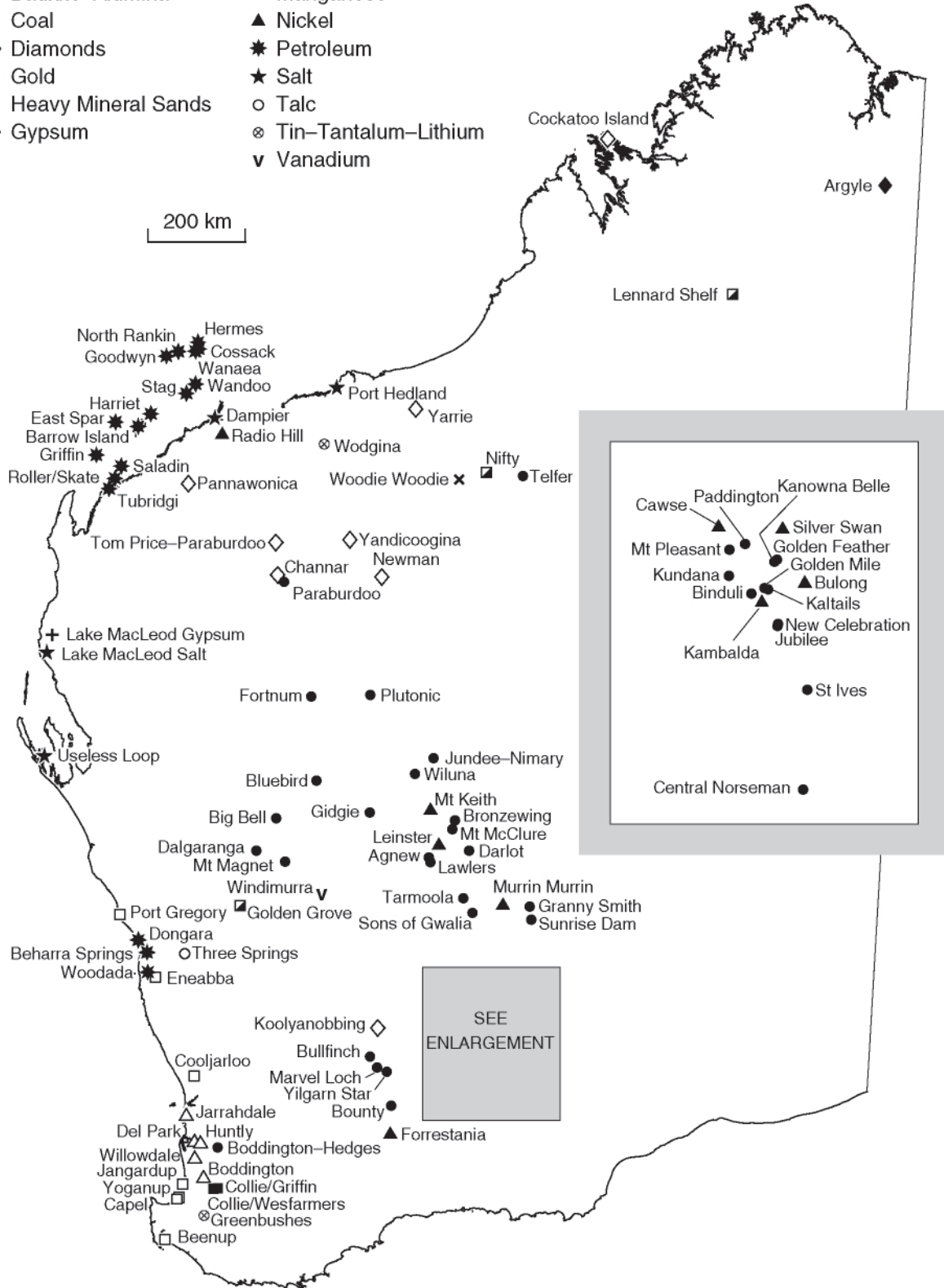


Figure 0.3

MAJOR MINERAL AND PETROLEUM PROJECTS IN WESTERN AUSTRALIA

- | | |
|-----------------------|------------------------|
| ▣ Base metals | ◇ Iron ore |
| △ Bauxite-Alumina | × Manganese |
| ■ Coal | ▲ Nickel |
| ◆ Diamonds | ★ Petroleum |
| ● Gold | ★ Salt |
| □ Heavy Mineral Sands | ○ Talc |
| + Gypsum | ⊗ Tin-Tantalum-Lithium |
| | ∨ Vanadium |



This publication is now available
on our web site
www.dme.wa.gov.au

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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